Government of Madras

DEVELOPMENT DEPARTMENT

G.O. No. 1456, 4th November 1922

Forests—South Kanara district—Rivers—Floating facilities—Investigation—Dropped.

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Forests—South Kanara district—Rivers—Floating facilities—Investigation—Dropped.

READ—the following papers :—

I

Letter from S. Cox, Esq., C.I.E., I.F.S., Chief Conservator of Forests, to the Secretary to Government, Development Department, dated Madras, the 20th August 1921, Ref. No. 298/20-2.

I have the honour to submit herewith for the orders of Government copy of a report, dated 18th July 1921, from the Conservator of Forests, Sixth Circle, proposing an examination of the main rivers in the South Kanara district with a view to improving their floating capabilities.

2. In this connexion reference is solicited to Mr. Tireman's report No. 517, dated 17th February 1920, (copy enclosed) on the scheme for development of the South Kanara forests. One of the proposals made by Mr. Tireman was that steps should be taken to facilitate floating, in the Kumharadari and Paishwani rivers. Government have already sanctioned an estimate for Rs. 4,000 for blasting and clearing obstructions in the Paishwani river—vide G.O. No. 369 I., dated 20th November 1920. Mr. Tireman now requests that orders may be issued for an examination of four other rivers in the ensuing dry weather, so that necessary works may be undertaken in due course to render these rivers also navigable for timber rafts. Should Government see no objection I request that orders may be issued to the Public Works Department to undertake an examination and report the result.

3. Mr. Tireman's report on the development of South Kanara forests referred to above, was informally discussed by the Executive Council in May 1920 and the proposals received general assent; but I refrained from placing them formally before Government until I was able to spare an officer for special duty to prepare a forest project for the whole district, a work which would take several months to complete. Mr. Tireman now hopes that with the help of the Forest Utilization Officer he will be able to prepare a scheme himself during the coming cold weather. Meanwhile, I request that orders may be issued for an examination of the rivers in the manner indicated by the Conservator.

ENCLOSURES

(i)

Letter from the Conservator of Forests, Sixth Circle, Ootacamund, to the Chief Conservator of Forests, dated Ootacamund, the 18th July 1921, No. Ref. M. 344/21-1.

In connexion with my proposals for the development of the South Kanara forests (vide my C. No. 517/20-1, dated 17th February 1920) it will be necessary to examine the main rivers in that district with a view to improving their floating capabilities and I request that Government may be addressed with a view to such an examination being commenced during the ensuing dry weather. The following rivers will require examination :—

(1) The Kumaradhari river from the junction of the Kallaje and Adi-Holes to Uppinangadi about thirty-two miles.

(2) The Gundia river from Gundia to its junction with No. 1 about sixteen miles.

(3) The Netravati river and its affluent the Charmadi river from Charmadi to Uppinangadi about twenty-four miles.

(4) The Shishla river from Shishla to its junction with No. 3 about fifteen miles.

These four rivers are in the Uppinangadi taluk. There are several in the more northern taluks, but before I ask for their examination I should prefer to see something of the country. The examination of the four rivers named will probably be as much as can be done in one season.

(ii)

Letter from the Conservator of Forests, Western Circle, Coimbatore, to the Chief Conservator of Forests, dated Coimbatore, the 17th February 1920, No. 517.

I have the honour to report that I have now seen a fair proportion of the forests in the South Mangalore Division and to put forward the following proposals for their future treatment. The object of my two visits—one to the Paishwani river valley, and the other to the forests in the basin of the Netravati on the Mangalore–Shiradi road—was to ascertain whether there was any prospect of a big scheme of exploitation. This may at once be ruled out of the question as the forests have almost all been subjected to kumri in the not very distant past, and are on the whole of poor quality. Small patches of very fine evergreen forest do exist having evidently escaped kumri, and there are also patches containing deciduous timber of large size which presumably have not been kumried for a long period of years. Mr. W. C. Hart, Extra Assistant Conservator of Forests, who, a few years ago, was engaged in preparing working-plans for the forests of Paishwani and Kumharadari valleys examined these patches both evergreen and deciduous in some detail and estimated their extent at about 17,000 acres. He further estimated that the over-mature stock therein amounted to something like 120,000 tons of timber; making due allowance for over-sanguine estimates, if only these patches formed one or two compact blocks it would be possible to embark on a big scheme of exploitation, but unfortunately they are scattered over something like 250,000 acres and are for the most part of small extent, the largest measuring about 4,000 acres. Concentration, with which alone any exploitation scheme on a large scale would be profitable, is thus out of the question, and a further adverse feature is the fact that the patches are not all situated in the same river basin.

2. There are however endless possibilities for the future. The state here possesses a very large and compact area of forest extending over some 250,000 acres. I have no doubt whatever that the greater part if not the whole of this was once covered with magnificent evergreen forest. My reasons for holding this opinion are, firstly that from a careful study of the factors governing the distribution of evergreen and deciduous forest I am convinced that in this climate with an annual rainfall of upwards of 200 inches the forests are always evergreen unless they have been subjected to fire or are situated on very shallow soil, secondly the existence of the evergreen patches referred to above which carry as fine a stand of timber as I have seen in any forest and which in no way differ as regards the factors of the locality from the surrounding country which we know to have been subject to kumri, thirdly the fact that in most of the valleys which, though almost certainly kumried in the past, retain in such a damp climate a considerable quantity of moisture throughout the hot weather, thus escaping the annual fires which sweep over the drier hill sides, the forest is evergreen with occasional large trees of Vateria indica and Hopea vightiana, and lastly the fact that in the forests which have been protected from fire an evergreen undergrowth is gradually spreading under the deciduous trees. Whether I am right or wrong however I think that there can be no doubt that an evergreen crop in this locality is to be preferred to a deciduous one owing to the greater stand of timber, the better quality of evergreen trees as regards soundness, and the fact that an evergreen crop requires less attention than a deciduous one. In parenthesis it would be as well to say that I have seen no land suitable for growing teak.

3. Despite the absence hitherto of much systematic research into the sylviculture of the evergreen species sufficient is known regarding certain species to make it a matter of practical certainty that they can be successfully cultivated in the forest tract under consideration. I refer to Hopea parviflora, Vateria indica, Artocarpus hirsuta and mango. Hopea has been cultivated for generations by the ryots of Kanara, and it has of recent years been sown in several places under a deciduous crop. I have seen several of these sowings and have found only one failure which was due to the choking of the seedlings by a dense growth of Strobilanthus the result of a severe opening of the canopy, and of subsequent absence of attention. Vateria indica is commonly planted or sown in Kanara as an avenue tree, and I have moreover successfully raised it under deciduous shade in Coorg though only on an experimental scale. Artocarpus hirsuta will grow anywhere on the west coast. I have raised it in Coorg in a fairly large scale in the open and on a small scale under shade, and I saw in Kanara some very promising sowings. Mango is one of the easiest trees to grow from seed. A forest composed of these species will be extremely valuable; two of them yield timber of the very first quality which moreover is highly prized in the local markets, while the other two yield excellent box-making timber.

4. There being therefore little doubt as to the possibility of replacing the existing poor stock—consisting chiefly of badly grown Xylia, Terminalia tomentosa and Terminalia paniculata—by the species enumerated above, or of the subsequent value of a crop consisting thereof, I recommend that steps be taken to stock as large an area as possible with them. I cannot specify at present the area which can be dealt with annually, but in order to lose no time I have already given orders that 1,000 acres are to be sown this year and in a short time it should be possible to draw up a definite scheme of working. Sowing is a cheap method, and I see no reason—given sufficient establishment—why we should not eventually restock one-hundredth part of the area (i.e., about 2,500 acres) every year. An inspection of any evergreen forest will show that the species selected come to no harm if the seedlings are left to themselves, and there is thus

no reason why sowing should not proceed in advance of the tending which of course will subsequently be required to establish the young crop. In any case if this view proves to be wrong not much harm will have been done. Later on when we know more about them we can introduce other evergreen species. I would not sow the evergreen crop in places where there is a really good young crop already on the ground of the valuable deciduous species. Such young crops chiefly Xylia occur occasionally in patches.

5. It will be necessary when this is possible to increase the establishment to an extent which will permit of tending the whole of the crop to be sown, i.e., possibly 2,500 acres per annum and of extracting the timber which will be felled in the course of the tending.—From experience of similar work in Coorg where, though the old crop is much more valuable, the young crop consisting of teak, rosewood, and Pterocarpus is much more costly to raise, I think it will be found that the timber which will be extracted in the interests of the young crop will more than cover the cost of establishing the latter even leaving out of account the patches containing fine timber. Including these latter the net result should show a fair profit, and the new crop should thus be established at no cost. To extract the timber at a profit however it is imperative to improve the rivers so as to facilitate floating which at present both in the Kumharadari and Paishwani rivers is very difficult and costly. Mr. Peddie of the Public Works Department has recently prepared an estimate for improving the Paishwani and I recommend that the work should be sanctioned and put in hand during the next dry weather. I also recommend that Government be asked at once to depute an officer to examine the Kumharadari river this dry weather and to submit an estimate for its improvement.

6. When the Paishwani has been improved and it should be possible to do this before the floating season of 1921 a large quantity of timber can be extracted from the over-mature patches in this valley commencing with the Jalsur East reserved forest where fellings as prescribed in Mr. Hart's working-plan are now in progress, although, owing to the difficulty in floating, the possibility laid down by him cannot be worked up to. He prescribed merely selection fellings. I propose to fell much more heavily and in fact to carry out fellings under the uniform method on the lines of those which you saw in Coorg. Mr. Hart estimates the possibility under his method at about 11,000 tons from about 400 acres. Under the uniform method it should be a good deal more but making allowances for unduly sanguine estimates and retaining Mr. Hart's figure there is ample work to keep the establishment employed for a couple of years or more.

7. In addition to the river training works it will be necessary largely to increase the dragging facilities in the Jalsur East and the other larger areas of good timber. I propose that the American Consulting Forest Engineer should be taken to the Paishwani valley and asked for his opinion, but the country is fairly easy and in the meantime I am in favour of constructing a considerable length of drag paths in the Jalsur East reserved forest in order that large quantities of timber can be dragged down to the Kandaka stream, a tributary of the Paishwani, which skirts the reserve, in time to be floated in the monsoon of 1921. Ranger Swamikutti could, I think, easily carry out the work of aligning these paths, and there is no reason why considerable progress should not be made next monsoon. With a good system of drag paths I foresee no difficulty in dragging by means of elephants and buffaloes or possibly a tractor a much larger quantity of timber than has yet been attempted.

8. I have alluded more than once to the question of establishment. My ideas on the subject are possibly on the large side, but I feel that here we have a property of very great potential value and if the Forest department is to justify its existence it is high time we set about to put that property into the best possible condition and to make two or more trees grow where only one grew before. The existing establishment is based on the works at present in progress. These are chiefly works of exploitation and have been inaugurated from time to time in various localities in a somewhat haphazard manner; no review of the needs of the forests as a whole has ever been undertaken as far as I am aware, nor have proposals on any serious scale ever been made to develop the valuable property aforesaid. I have not yet seen the forests of North Mangalore, but I gather that with the exception of the fuel, catechu and sandalwood reserves of the Coondapoor and Udipi ranges the greater part is in much the same condition as the forests of the South Division and that the area of such forest is about 150,000 acres. We thus have 400,000 acres to deal with, or on a provisional rotation of 100 years 4,000 acres per annum to stock with a young crop and to clear of the existing one. I do not think that one Ranger can deal efficiently with the sowing, tending and fire-protection of more than 500 acres per annum, and as I very roughly estimate that the old crop will yield on the average 12 tons per acre (which means 6,000 tons off 500 acres) I think that another ranger will be required for the exploitation of this quantity of timber. Thus 16 rangers will in the not very distant future be required for the 400,000 acres of timber forest with possibly two more for fuel, catechu, and sandalwood or 18 in all, as compared with the present establishment of 7. It will also be necessary to form another division, two District Forest Officers each probably dealing with an annual regeneration area of 1,600 acres and the third with one of 800 acres in addition to the fuel, catechu and sandal work. As things are at present it is useless going into the question of the territorial arrangement of the divisions and ranges, nor do I propose to deal with the lower subordinate establishment which will be required. If my proposals are generally accepted the District Forest Officer can work out details.

9. The South Division is very badly off in the matter of buildings; if the work which I am now advocating is to be properly done it will be necessary for forest officers in future to

stay in one place for several days at a time; in the case of the local fund sheds they can never be sure of not being turned out, and these sheds are for the most part miserable affairs and usually located in the most malarious places—presumably in order to obtain water easily. Considerable expenditure therefore will be necessary in order to provide comfortable and healthy quarters for the District Forest Officer, Rangers, Foresters and Guards. Communications also are very inadequate. The good roads all run east and west across the forests and although there is a road running more or less through the forests northwards from Jalsur to near Beltangadi in three sections with a total length of about 50 miles, it is impassable for a motor-car for most of the year, and even for carts for a considerable part of the year. It is essential that we should have a road passable for a car except during heavy floods and I advocate improving this road accordingly. It will also be necessary to construct a number of subsidiary fair weather roads. This would probably cost in all about Rs. 2 lakhs while another sum of about Rs. 1 lakh will be required for buildings. In the North Division which I have not yet seen possibly Rs. 2 lakhs would be required for similar work, while propably Rs. 2 lakhs would be required in both divisions together for river improvement work. The total outlay would thus be in the neighbourhood of Rs. 7 lakhs. This does not make provision for dragpaths and carting roads for extracting timber to the rivers: the country is as a rule fairly easy and these should not cost very much; their cost will moreover be covered almost immediately by the sale-proceeds of the timber extracted. The Rs. 7 lakhs referred to represent a capital investment. My figures are of course very rough etails have to be worked out by the District Forest Officers.

10. Seven lakhs is perhaps a somewhat alarming figure compared with what the department is accustomed to spend, but the district has been starved in the past. The total expenditure in the whole district (North and South Divisions) during the last twenty years has been on roads and bridges Rs. 27,763; on buildings Rs. 58,435; on sowing and planting Rs. 5,154; and on other works of improvement (A. VIII. g) Rs. 17,631; and annual average on works of improving the forest (exclusive of protection from fire) of Rs. 5,449. With expenditure on these lines we are not going to make much progress.

11. On the modest estimate of 12 tons to the acre referred to in paragraph 8 the annual yield obtained by working 4,000 acres per annum would be 48,000 tons. A very low estimate of the net profit obtainable on this is Rs. 10 per ton which means an annual profit of nearly Rs. 5 lakhs; this after paying for the necessary sylvicultural work and establishment (perhaps Rs. 2 lakhs) would in the course of a very few years repay all the capital invested. It must also be remembered that the existing crop is growing larger every year and that the annual yield will thus gradually increase.

12. In the immediate future I propose as outlined in paragraphs 4 to 7 to sow 1,000 acres per annum in the South Division, to render floating in the Kumaradari and Paishwani rivers easy, and to extract as much timber as possible from the Jalsur East reserve. For this at least one additional ranger is required, and the District Forest Officer is now preparing proposals to split the existing unwieldy Uppinangadi range which covers 154,000 acres. I am also giving orders to have 1,000 acres sown this year in the North Division. I also propose to close down the various scattered works such as improvement fellings, climber cuttings and the like which are now proceeding in what I have called a somewhat haphazard manner, and to concentrate all the energies of the division of the new work. Fire protection of the sown area will be a sine qua non and I am calling on the District Forest Officer to submit proposals. As regards the North Division I hope to tour there next year and to work out some definite details as to what is required.

13. If you agree with my views I request that you will put my letter before Government. I think that it should know what a potentiality fine property it possesses in its South Kanara forests and be requested to state whether it is prepared to make the outlay necessary to put that property into order. In any case the outlay is not likely to be more than about Rs. 2 per acre, and this will probably very soon be recouped. My scheme is not—as I had hoped—one which is going to bring in a large return at an early date, but the owner of a forest property must look a long way ahead; in this case the return though long deferred should be a very fine one.

II

Official Memorandum No. 1589/21-I.B.-1, Public Works, dated 7th September 1921.

A copy of the letter from the Chief Conservator of Forests, Reference No. 298-20-2, dated 20th August 1921, together with its enclosure is herewith forwarded to the Superintending Engineer, IV Circle, who is requested to arrange for an early examination of the four rivers referred to therein with a view to improving their floating capabilities and submit a report on the subject.

(By order)

R. NARASIMHA AYYANGAR,
Under Secretary to Government.

To the Superintending Engineer, IV Circle.

III

Letter from P HAWKINS, Esq., M. INST. C.E., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated Coimbatore, the 11th August 1922, No. 239-I.

With reference to your Memorandum No. 1589/21-I.B.-1, dated 7th September 1921, I have the honour to forward herewith the marginally-noted five estimates aggregating to Rs. 5,88,500 together with a preliminary report submitted by the Subdivisional Officer and a tracing. On the basis of the standard of clearance adopted the Kumaradhari and Gundia rivers can be cleared fairly easily while the others would be expensive.

	Rs.
(1) Blasting rock and clearing obstructions in the Kallaja hole	5,000
(2) Blasting rock and clearing obstructions in the Kumaradhari hole	1,90,000
(3) Blasting rock and clearing obstructions in the Gundia hole	33,000
(4) Blasting rock and clearing obstructions in the Netravati river	3,55,000
(5) Blasting rock and clearing obstructions in the Shisla hole	5,500

The amount of clearance which the Forest department would require is, however, not quite certain. Much would depend upon the season of the year at which their rafting operations would be undertaken. I have instructed the Executive Engineer to consult the Forest department on this point with a view to fix the level down to which a channel should be cleared, and am also consulting the Conservator of Forests, Sixth Circle.

I am sending you separately a report of progress on the Paishwani river, which has been satisfactory.

ENCLOSURES

(1)

Letter from the Assistant Engineer, South Kanara subdivision, dated the 10th July 1922, No. 738-E.

Report on floating capabilities of certain rivers in Uppinangadi taluk.

I submit herewith the report received from Overseer M.R.Ry. S. Nanjunda Ayyar on the investigation of the four rivers specified in the letter from the Conservator of Forests, Sixth Circle. I regret I had no opportunity to examine the rivers which I wished to do after the receipt of his report, but having to attend to the Paishwani river work he could not submit it earlier. It is now too late to examine the rivers owing to freshes.

2. To enable the floating of timber the rivers have to be improved at a prohibitive cost—approximate estimates are attached :—

(1) (*a*) Kallaja hole for a length of 9 miles above its junction with the Kumaradhari—Rs. 5,000.

This was included in the investigation as decided by the Chief Conservator of Forests during the conference held in December last.

(*b*) The Kumaradhari from the infall of Kallaja hole down to Uppinangadi—about 32 miles—Rs. 1,90,000.

(2) The Gundia from Gundia down to its junction with the Kumaradhari—length about 16 miles—Rs. 33,000.

(3) The Netravati and its affluent Charmadi hole from Charmadi down to Panemangalore—Rs. 3,55,000.

The portion between Uppinangadi and Panemangalore which will cost about Rs. 20,000 was included as decided at the conference. This will be necessary in case the Kumaradhari alone is to be improved.

(4) The Shisla from Shisla to Parasurama devasthanam—a distance of about 8 miles—Rs. 5,500.

Below Parasurama devasthanam it will not be possible to float timber since at Parapikallu obstruction the river has a sudden fall of 20 feet, and below the river runs in deep and rocky gorges with zig-zag course and sudden drops with right angle bend at every fall for a length of about 3½ miles. Even if it be possible to improve the river the cost will be too prohibitive. Therefore the portion below Parasurama devasthanam has been omitted. Timber may be floated down from Shisla to the above point whence it may be carted to 37 miles on Shiradi road. From there it can be sent down the Netravati.

(5) The obstructions in items 1 (*a*), 2 and 4 are in no way formidable.

Item 1 (*b*)—*Kumaradhari.*—At Yakkadka, below the junction of Gundia and at Viramangila there are drops in the river of 5′ to 6′; the river course is very zig-zag, the bed very rocky. Also commencing from Narimogaru down to the junction with the Netravati the river has rocky bed with projecting boulders with winding and zig-zag course, deep and rapid gorges and drops.

Item 3—*Netravati.*—At Arbi obstruction about a mile below the Dharmasthala road crossing the river has a sudden fall of 15′ to 20′ and runs in deep rocky gorges with zig-zag course for a length of about 2 miles. There are similar difficult obstructions (1) about half a mile above Dharmasthala road crossing, (2) below the junction of Beltangadi hole (3) beyond Uppinangadi to the west, viz., Shripadi obstruction, (4) at Bantwal. But the worst of these is the one at Arbi.

(6) Considering the prohibitive cost of improvement of these rivers, Netravati in particular, the improvement of this river from Charmadi down to 37 miles on Shiradi road may be altogether dropped.

The cost of improvement to the Netravati below 37 miles on Shiradi road will be about Rs. 28,000.

(7) The estimates allow for clearing a channel 20′ wide to enable timber being floated. The rate allowed is the same as that for Paishwani river work.

(8) The six atlas sheets received with No. 949-S.K., dated 21st December 1921, are herewith returned.

(2)

General report to accompany the estimates for blasting rock and clearing obstructions in the rivers in Uppinangadi taluk.

[Amount of all estimates Rs. 5,88,500.]

These have been prepared as per reference from the Chief Conservator of Forests in his No. 298/20-2, dated 20th August 1921, requesting to inspect all the rivers in Uppinangadi taluk regarding their floating capabilities bearing Public Works Department Memorandum No. 1589/21-I.B.-1, dated 7th September 1921.

All the rivers as per the reference of the Conservator of Forests have been investigated by me with the help of Forest Guards guiding me along the margin, and estimates have been prepared for all the rivers except one, i.e., Shisla hole for which an estimate has been prepared till Parasurama Devasthanam and beyond Parasurama Devasthanam it is not possible to float since at Parapikallu where the river falls vertically by 20 feet and from there the river goes in deep gorges with steep rocky margin and with right-angular turnings at every fall. Below this Parapi for a length of 3½ miles the river goes in rocky gorges with many bed falls and zig-zag turnings. So the portion from Parasurama Devasthanam up to the junction with Netravati has been left out and the timber can easily be carted on road from Parasurama Devasthanam up to 37th mile on Siradi road and then floated in the Netravati.

Kallaje hole.—There are not much obstructions in the river except at few places and that too not difficult ones.

Kumaradhari.—The difficult portions are at (1) Yekkada, (2) below the junction with Gundia, (3) Viramangila, (4) Narimogaru commencement up to junction with Netravati.

Gundia hole.—There are only very few difficult obstructions in this river.

Netravati river.—The difficult portions are (1) half a mile above Dharmastala road crossing, (2) one mile below Dharmastala road crossing known as Arbi obstruction, (3) below the junction with Beltangadi hole, (4) Shripadi obstruction, (5) Bantwal obstruction.

Of all the above obstructions, Arbi obstruction is one of the difficult ones where the water falls vertically from 15 feet height and below for a length of two miles the river goes in rocky beds with zig-zag turnings and also with bed falls here and there.

Shisla hole.—There are not much rock from Shisla down to Parasurama devasthanam but there are lot of temporary dams built across the river for irrigation purposes.

The estimate provides for blasting rock and removing the same and also for erecting sheds for work people and storing materials tools and plants, etc. The rate allowed for in the estimate is as for Paishwani works in progress.

(3)

Endorsement by the Executive Engineer, West Coast division, No. 828-S.E., dated 20th July 1922.

Forwarded to Superintending Engineer, IV Circle, with maps showing the different names of the rivers dealt with. I have not been able to make any inspection of the rivers personally and inspection before the end of the monsoon would be useless. But from the Subdivisional Officer's report which is very clear, it seems that the Kumaradari river and the Gundia can be improved at a reasonable cost. While with regard to the others the cost seems prohibitive. Inspection will be possible probably about November or December next and I will then submit a further report if you think it necessary.

Order—No. 1456, Development, dated 4th November 1922.

In August 1921 the Chief Conservator of Forests submitted proposals that certain rivers in the Uppinangadi taluk in the South Kanara district should be investigated with a view to clearing the obstructions in their course in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation has been made by the Public Works Department and the total cost has been estimated to be Rs. 5,88,500. The Government consider that the operations on these river beds must await the investigation by the Chief Forest Engineer of the whole scheme for the development of the South Kanara forests.

2. The Chief Conservator of Forests is requested to submit a report as to the effect of similar operations undertaken in the Paishwani river with reference to G.O. No. 369 I., dated 20th November 1920.

(By order of the Governor in Council)

H. G. Stokes,
Acting Secretary to Government.

To the Chief Conservator of Forests.
,, Public Works Department (with estimates and one plan).
,, Publicity Officer.

NOTES CONNECTED WITH G.O. No. 1456, DEVELOPMENT, DATED 4TH NOVEMBER 1922.

[SUBJECT.—*South Kanara forests—Examination of the rivers for forest exploitation.*]

From the Chief Conservator of Forests, Ref. No. 298-20-2, *ated the 20th August* 1921.

Please see the Chief Conservator's letter. Submitted that the Public Works Department (Irrigation) may be requested to issue orders for examining the four rivers mentioned in Mr. Tireman's letter dated 18th July 1921 with a view to improving their floating capabilities.

R.V.—30-8-21. K. NAGESWARA RAO—2-9-21.
J. M. TURING—2-9-21.

PUBLIC WORKS (IRRIGATION) DEPARTMENT.

Please see the letter from the Chief Conservator of Forests and the Development Department note above. A copy of the letter with its enclosures may be sent to the Superintending Engineer, IV Circle, for report of the floating capabilities of the four rivers mentioned therein. A draft endorsement to the Superintending Engineer is accordingly submitted for approval and orders for issue. The Superintending Engineer will be reminded after two months.

T.S.R.—6-9-21. R. NARASIMHA AYYANGAR—7-9-21.
A. H. MORIN—2-9-21.

[Memorandum No. 1589/21 I.B., dated 7th September 1921.]

From the Superintending Engineer, IV Circle, No. 239 *I., dated* 11*th August* 1922.

Submitted for orders if the estimates submitted by the Superintending Engineer may be examined in Technical section. No preliminary report has been received with the estimates These estimates were called for with reference to paragraphs 2 and 3 of the letter from the Chief Conservator of Forests. If it is not considered necessary to check the estimates, the file may be sent to the Development Department for remarks as to further action to be taken.

T.S.R.—15-8-22.

The preliminary report which is missing may be called for.

R.N.—13-8-22. A.H.M.—15-8-22.

A draft memorandum to the Superintending Engineer, IV Circle, calling for the missing preliminary report for the work is submitted for approval.

2. A report of the progress of work on the Paishwani river promised by the Superintending Engineer in his letter No. 239 I., dated 11th August 1922, has now been received and is put up in the linked file.

G.V.—22-8-22. R.N.—22-8-22.

The file may be sent to Development for remarks. The cost seems to be prohibitive.

R.N.—5-9-22. A.H.M.—5-9-22

DEVELOPMENT DEPARTMENT.

Last year the Chief Conservator requested that the Public Works Department may be asked to make an examination of certain rivers in the South Kanara district with a view to improving their floating capabilities. This formed part of a scheme which the Chief Conservator had on hand for the development of South Kanara forests. The rivers have been examined by the Public Works Department who reported that the estimated cost of improving them is Rs. 5,88,500.

2. The Chief Conservator has since submitted his report on the development of South Kanara forests and he has been informed that the scheme is too ambitious and that it should lie over until the exploitation branch is in a position to tackle it. Perhaps the proposal in this file may also lie over for the present.

The file may be sent to the Chief Conservator for perusal with the concurrence of the Public Works Department.

S.R.R —11-9-22. K. NAGESWARA RAO—12-9-22.

H. G. STOKES—13-9-22.

OFFICE OF THE CHIEF CONSERVATOR OF FORESTS.

The cost of the larger schemes is so great that there is no use proceeding further with them until the new Engineering branch has had an opportunity of examining the whole project for exploiting the Kanara forests.

2. Meanwhile the comparatively cheap scheme for the improvement of the Netravati below 37/0 miles on the Shiradi road should be proceeded with. This will cost about Rs. 28,000. A fair quantity of timber is extracted from 37/0 miles on the Shiradi road. At present there is no very great difficulty in floating this timber with the help of bamboos, but the bamboos are fast dying and in another year or two there will be none left. If extraction of timber is to go on it will be necessary to float it with the help of boats, the logs being lashed alongside on both sides. This cannot be done unless the existing passages through the rocks are widened. If the work of improving the reach in question is done a much larger quantity of timber can be extracted than is dealt with now, and the cost (Rs. 28,000) will soon be recouped.

H. TIREMAN—3-10-22.

DEVELOPMENT DEPARTMENT.

The Chief Conservator's proposal may be supported and the file passed on to Public Works Department. It is believed that the necessary funds will be provided for in that department's budget.

K.N.R.—10-10-22.

The proposals in this file relate to a suggestion made in 1921 by the Chief Conservator of Forests that certain rivers in the Uppinangadi taluk in South Kanara should be investigated with a view to clearing the obstructions in their course, in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation of the rivers has been made under the orders of the Public Works Department but I observe that no officer higher than an overseer has made the investigation or has inspected the rivers. The total cost is put down at Rs. 5,88,500. It is distributed as follows :—

		Rs.
(1)	On the Kumaradhari river two schemes—one at Rs. 5,000 and the other at Rs. 1,90,000	1,95,000
(2)	On the Gudia river	33,000
(3)	The Netravati	3,55,000
(4)	The Shishla river	5,500
	Total ...	5,88,500

Copied by G.V.K. 4-11-22.
Examined.

Dev. DEPARTMENT.

Forests-- South Kanara District-- Rivers--Floating facilities--
Investigation--Dropped.

READ AGAIN G.O. No. ....., dated 19

" " " " ....., " 19

READ ALSO:

C. No. From the CCF No 298/22, dated 10-8- 1922.

" " 1969 I/22 " to S.E. IV Circle, 1589/4 dated 7-9-1922.

" from S.E. IV circle, " 239 & 8 " 11-8- 1922.

ORDER. No. 1456, dated 4-11- 1922

In August 1921 the Chief Conservator of Forests submitted proposals that certain rivers in the Uppinangadi taluk in the South Kanara Dt. should be investigated with a view to clearing the obstructions in their course in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation has been made by the P.W.D. and the total cost has been estimated to be Rs. ~~2,56,890~~ 5,88,500. The Govt. consider that the operations on these river beds must await the investigation by the Chief Forest Engineer and the development of the South Kanara Forests.

2. The Chief Conservator of Forests is requested to submit a report as to the effect of similar operations undertaken in the Paishwani river with reference to G.O. No. 369 I, dated 20-11-20.

DESPATCHED
8 NOV 1922

To

The C.C. of Forests (A)

" P.W.D. (A&b) with estimates and map.

" Publicity Officer.

Government of Madras

DEVELOPMENT DEPARTMENT

G.O. No. 1456 4th November 1922

Forests—South Kanara district—Rivers—Floating facilities—Investigation—Dropped.

READ—the following papers :-

Letter from S. Cox, Esq., C.I.E., I.F.S., Chief Conservator of Forests, to the Secretary to Government, Development Department, dated Madras, the 20th August 1921, Ref. No. 298/20-2.

I have the honour to submit herewith for the orders of Government copy of a report, dated 18th July 1921, from the Conservator of Forests, Sixth Circle, proposing an examination of the main rivers in the South Kanara district with a view to improving their floating capabilities.

2. In this connexion reference is solicited to Mr. Tireman's report No. 517, dated 17th February 1920 (copy enclosed) on the scheme for development of the South Kanara forests. One of the proposals made by Mr. Tireman was that steps should be taken to facilitate floating, in the Kumharadari and Paishwani rivers. Government have already sanctioned an estimate for Rs. 4,000 for blasting and clearing obstructions in the Paishwani river—vide G.O. No. 369 I., dated 20th November 1920. Mr. Tireman now requests that orders may be issued for an examination of four other rivers in the ensuing dry weather, so that necessary works may be undertaken in due course to render these rivers also navigable for timber rafts. Should Government see no objection I request that orders may be issued to the Public Works Department to undertake an examination and report the result.

3. Mr. Tireman's report on the development of South Kanara forests referred to above, was informally discussed by the Executive Council in May 1920 and the proposals received general assent; but I refrained from placing them formally before Government until I was able to spare an officer for special duty to prepare a forest project for the whole district, a work which would take several months to complete. Mr. Tireman now hopes that with the help of the Forest Utilization Officer he will be able to prepare a scheme himself during the coming cold weather. Meanwhile, I request that orders may be issued for an examination of the rivers in the manner indicated by the Conservator.

ENCLOSURES

Letter from the Conservator of Forests, Sixth Circle, Ootacamund, to the Chief Conservator of Forests, dated Ootacamund, the 18th July 1921. No. Ref. M. 344/21-1.

In connexion with my proposals for the development of the South Kanara forests (vide my C. No. 517/20-1, dated 17th February 1920) it will be necessary to examine the main rivers in that district with a view to improving their floating capabilities and I request that Government may be addressed with a view to such an examination being commenced during the ensuing dry weather. The following rivers will require examination

(1) The Kumaradhari river from the junction of the Kallaie and Adi-Holes to Uppinangadi about thirty-two miles.

(2) The Gundia river from Gundia to its junction with No. 1 about sixteen miles.

(3) The Netravati river and its affluent the Charmadi river from Charmadi to Uppinangadi about twenty-four miles.

(4) The Shishla river from Shishla to its junction with No. 3 about fifteen miles

These four rivers are in the Uppinangadi taluk. There are several in the more northern taluks, but before I ask for their examination I should prefer to see something of the country. The examination of the four rivers named will probably be as much as can be done in one season.

(ii)

Letter from the Conservator of Forests, Western Circle, Coimbatore, to the Chief Conservator of Forests, dated Coimbatore, the 17th February 1920, No. 517.

I have the honour to report that I have now seen a fair proportion of the forests in the South Mangalore Division and to put forward the following proposals for their future treatment. The object of my two visits—one to the Paishwani river valley, and the other to the forests in the basin of the Netravati on the Mangalore–Shiradi road—was to ascertain whether there was any prospect of a big scheme of exploitation. This may at once be ruled out of the question as the forests have almost all been subjected to kumri in the not very distant past, and are on the whole of poor quality. Small patches of very fine evergreen forest do exist having evidently escaped kumri, and there are also patches containing deciduous timber of large size which presumably have not been kumried for a long period of years. Mr. W. C. Hart, Extra Assistant Conservator of Forests, who, a few years ago, was engaged in preparing working-plans for the forests of Paishwani and Kumharadari valleys examined these patches both evergreen and deciduous in some detail and estimated their extent at about 17,000 acres. He further estimated that the over-mature stock therein amounted to something like 120,000 tons of timber; making due allowance for over-sanguine estimates, if only these patches formed one or two compact blocks it would be possible to embark on a big scheme of exploitation, but unfortunately they are scattered over something like 250,000 acres and are for the most part of small extent, the largest measuring about 4,000 acres. Concentration, with which alone any exploitation scheme on a large scale would be profitable, is thus out of the question, and a further adverse feature is the fact that the patches are not all situated in the same river basin.

2. There are however endless possibilities for the future. The state here possesses a very large and compact area of forest extending over some 250,000 acres. I have no doubt whatever that the greater part if not the whole of this was once covered with magnificent evergreen forest. My reasons for holding this opinion are, firstly that from a careful study of the factors governing the distribution of evergreen and deciduous forest I am convinced that in this climate with an annual rainfall of upwards of 200 inches the forests are always evergreen unless they have been subjected to fire or are situated on very shallow soil, secondly the existence of the evergreen patches referred to above which carry as fine a stand of timber as I have seen in any forest and which in no way differ as regards the factors of the locality from the surrounding country which we know to have been subject to kumri, thirdly the fact that in most of the valleys which, though almost certainly kumried in the past, retain in such a damp climate a considerable quantity of moisture throughout the hot weather, thus escaping the annual fires which sweep over the drier hill sides, the forest is evergreen with occasional large trees of Vateria indica and Hopea vightiana, and lastly the fact that in the forests which have been protected from fire an evergreen undergrowth is gradually spreading under the deciduous trees. Whether I am right or wrong however I think that there can be no doubt that an evergreen crop in this locality is to be preferred to a deciduous one owing to the greater stand of timber, the better quality of evergreen trees as regards soundness, and the fact that an evergreen crop requires less attention than a deciduous one. In parenthesis it would be as well to say that I have seen no land suitable for growing teak.

3. Despite the absence hitherto of much systematic research into the sylviculture of the evergreen species sufficient is known regarding certain species to make it a matter of practical certainty that they can be successfully cultivated in the forest tract under consideration. I refer to Hopea parviflora, Vateria indica, Artocarpus hirsuta and mango. Hopea has been cultivated for generations by the ryots of Kanara, and it has of recent years been sown in several places under a deciduous crop. I have seen several of these sowings and have found only one failure which was due to the choking of the seedlings by a dense growth of Strobilanthus the result of a severe opening of the canopy, and of subsequent absence of attention. Vateria indica is commonly planted or sown in Kanara as an avenue tree, and I have moreover successfully raised it under deciduous shade in Coorg though only on an experimental scale. Artocarpus hirsuta will grow anywhere on the west coast. I have raised it in Coorg in a fairly large scale in the open and on a small scale under shade, and I saw in Kanara some very promising sowings. Mango is one of the easiest trees to grow from seed. A forest composed of these species will be extremely valuable; two of them yield timber of the very first quality which moreover is highly prized in the local markets, while the other two yield excellent box-making timber.

4. There being therefore little doubt as to the possibility of replacing the existing poor stock—consisting chiefly of badly grown Xylia, Terminalia tomentosa and Terminalia paniculata—by the species enumerated above, or of the subsequent value of a crop consisting thereof, I recommend that steps be taken to stock as large an area as possible with them. I cannot specify at present the area which can be dealt with annually, but in order to lose no time I have already given orders that 1,000 acres are to be sown this year and in a short time it should be possible to draw up a definite scheme of working. Sowing is a cheap method, and I see no reason—given sufficient establishment—why we should not eventually restock one-hundredth part of the area (i.e., about 2,500 acres) every year. An inspection of any evergreen forest will show that the species selected come to no harm if the seedlings are left to themselves, and there is thus

no reason why sowing should not proceed in advance of the tending which of course will subsequently be required to establish the young crop. In any case if this view proves to be wrong not much harm will have been done. Later on when we know more about them we can introduce other evergreen species. I would not sow the evergreen crop in places where there is a really good young crop already on the ground of the valuable deciduous species. Such young crops chiefly Xylia occur occasionally in patches.

5. It will be necessary when this is possible to increase the establishment to an extent which will permit of tending the whole of the crop to be sown, i.e., possibly 2,500 acres per annum and of extracting the timber which will be felled in the course of the tending. From experience of similar work in Coorg where, though the old crop is much more valuable, the young crop consisting of teak, rosewood, and Pterocarpus is much more costly to raise, I think it will be found that the timber which will be extracted in the interests of the young crop will more than cover the cost of establishing the latter even leaving out of account the patches containing fine timber. Including these latter the net result should show a fair profit, and the new crop should thus be established at no cost. To extract the timber at a profit however it is imperative to improve the rivers so as to facilitate floating which at present both in the Kumharadari and Paishwani rivers is very difficult and costly. Mr. Peddie of the Public Works Department has recently prepared an estimate for improving the Paishwani and I recommend that the work should be sanctioned and put in hand during the next dry weather. I also recommend that Government be asked at once to depute an officer to examine the Kumharadari river this dry weather and to submit an estimate for its improvement.

6. When the Paishwani has been improved and it should be possible to do this before the floating season of 1921 a large quantity of timber can be extracted from the over-mature patches in this valley commencing with the Jalsur East reserved forest where fellings as prescribed in Mr. Hart's working-plan are now in progress, although, owing to the difficulty in floating, the possibility laid down by him cannot be worked up to. He prescribed merely selection fellings. I propose to fell much more heavily and in fact to carry out fellings under the uniform method on the lines of those which you saw in Coorg. Mr. Hart estimates the possibility under his method at about 11,000 tons from about 400 acres. Under the uniform method it should be a good deal more but making allowances for unduly sanguine estimates and retaining Mr. Hart's figure there is ample work to keep the establishment employed for a couple of years or more.

7. In addition to the river training works it will be necessary largely to increase the dragging facilities in the Jalsur East and the other larger areas of good timber. I propose that the American Consulting Forest Engineer should be taken to the Paishwani valley and asked for his opinion, but the country is fairly easy and in the meantime I am in favour of constructing a considerable length of drag paths in the Jalsur East reserved forest in order that large quantities of timber can be dragged down to the Kandaka stream, a tributary of the Paishwani, which skirts the reserve, in time to be floated in the monsoon of 1921. Ranger Swamikutti could, I think, easily carry out the work of aligning these paths, and there is no reason why considerable progress should not be made next monsoon. With a good system of drag paths I foresee no difficulty in dragging by means of elephants and buffaloes or possibly a tractor a much larger quantity of timber than has yet been attempted.

8. I have alluded more than once to the question of establishment. My ideas on the subject are possibly on the large side, but I feel that here we have a property of very great potential value and if the Forest department is to justify its existence it is high time we set about to put that property into the best possible condition and to make two or more trees grow where only one grew before. The existing establishment is based on the works at present in progress. These are chiefly works of exploitation and have been inaugurated from time to time in various localities in a somewhat haphazard manner; no review of the needs of the forests as a whole has ever been undertaken as far as I am aware, nor have proposals on any serious scale ever been made to develop the valuable property aforesaid. I have not yet seen the forests of North Mangalore, but I gather that with the exception of the fuel, catechu and sandalwood reserves of the Coondapoor and Udipi ranges the greater part is in much the same condition as the forests of the South Division and that the area of such forest is about 150,000 acres. We thus have 400,000 acres to deal with, or on a provisional rotation of 100 years 4,000 acres per annum to stock with a young crop and to clear of the existing one. I do not think that one Ranger can deal efficiently with the sowing, tending and fire-protection of more than 500 acres per annum, and as I very roughly estimate that the old crop will yield on the average 12 tons per acre (which means 6,000 tons off 500 acres) I think that another ranger will be required for the exploitation of this quantity of timber. Thus 16 rangers will in the not very distant future be required for the 400,000 acres of timber forest with possibly two more for fuel, catechu, and sandalwood or 18 in all, as compared with the present establishment of 7. It will also be necessary to form another division, two District Forest Officers each probably dealing with an annual regeneration area of 1,600 acres and the third with one of 800 acres in addition to the fuel, catechu and sandal work. As things are at present it is useless going into the question of the territorial arrangement of the divisions and ranges, nor do I propose to deal with the lower subordinate establishment which will be required. If my proposals are generally accepted the District Forest Officer can work out details.

9. The South Division is very badly off in the matter of buildings; if the work which I am now advocating is to be properly done it will be necessary for forest officers in future to

stay in one place for several days at a time; in the case of the local fund sheds they can never be sure of not being turned out, and these sheds are for the most part miserable affairs and usually located in the most malarious places—presumably in order to obtain water easily. Considerable expenditure therefore will be necessary in order to provide comfortable and healthy quarters for the District Forest Officer, Rangers, Foresters and Guards. Communications also are very inadequate. The good roads all run east and west across the forests and although there is a road running more or less through the forests northwards from Jalsur to near Beltangadi in three sections with a total length of about 50 miles, it is impassable for a motor-car for most of the year, and even for carts for a considerable part of the year. It is essential that we should have a road passable for a car except during heavy floods and I advocate improving this road accordingly. It will also be necessary to construct a number of subsidiary fair weather roads. This would probably cost in all about Rs. 2 lakhs while another sum of about Rs. 1 lakh will be required for buildings. In the North Division which I have not yet seen possibly Rs. 2 lakhs would be required for similar work, while propably Rs. 2 lakhs would be required in both divisions together for river improvement work. The total outlay would thus be in the neighbourhood of Rs. 7 lakhs. This does not make provision for dragpaths and carting roads for extracting timber to the rivers; the country is as a rule fairly easy and these should not cost very much; their cost will moreover be covered almost immediately by the sale-proceeds of the timber extracted. The Rs. 7 lakhs referred to represent a capital investment. My figures are of course very rough; details have to be worked out by the District Forest Officers.

10. Seven lakhs is perhaps a somewhat alarming figure compared with what the department is accustomed to spend, but the district has been starved in the past. The total expenditure in the whole district (North and South Divisions) during the last twenty years has been on roads and bridges Rs. 27,763; on buildings Rs. 58,435; on sowing and planting Rs. 5,154; and on other works of improvement (A. VIII. g) Rs. 17,631; and annual average on works of improving the forest (exclusive of protection from fire) of Rs. 5,449. With expenditure on these lines we are not going to make much progress.

11. On the modest estimate of 12 tons to the acre referred to in paragraph 8 the annual yield obtained by working 4,000 acres per annum would be 48,000 tons. A very low estimate of the net profit obtainable on this is Rs. 10 per ton which means an annual profit of nearly Rs. 5 lakhs; this after paying for the necessary sylvicultural work and establishment (perhaps Rs. 2 lakhs) would in the course of a very few years repay all the capital invested. It must also be remembered that the existing crop is growing larger every year and that the annual yield will thus gradually increase.

12. In the immediate future I propose as outlined in paragraphs 4 to 7 to sow 1,000 acres per annum in the South Division, to render floating in the Kumaradari and Paishwani rivers easy, and to extract as much timber as possible from the Jalsur East reserve. For this at least one additional ranger is required, and the District Forest Officer is now preparing proposals to split the existing unwieldy Uppinangadi range which covers 154,000 acres. I am also giving orders to have 1,000 acres sown this year in the North Division. I also propose to close down the various scattered works such as improvement fellings, climber cuttings and the like which are now proceeding in what I have called a somewhat haphazard manner, and to concentrate all the energies of the division of the new work. Fire protection of the sown area will be a sine qua non and I am calling on the District Forest Officer to submit proposals. As regards the North Division I hope to tour there next year and to work out some definite details as to what is required.

13. If you agree with my views I request that you will put my letter before Government. I think that it should know what a potentiality fine property it possesses in its South Kanara forests and be requested to state whether it is prepared to make the outlay necessary to put that property into order. In any case the outlay is not likely to be more than about Rs. 2 per acre, and this will probably very soon be recouped. My scheme is not—as I had hoped—one which is going to bring in a large return at an early date, but the owner of a forest property must look a long way ahead; in this case the return though long deferred should be a very fine one.

II

Official Memorandum No. 1589/21-I.B.-1, Public Works, dated 7th September 1921.

A copy of the letter from the Chief Conservator of Forests, Reference No. 298-20-2, dated 20th August 1921, together with its enclosure is herewith forwarded to the Superintending Engineer, IV Circle, who is requested to arrange for an early examination of the four rivers referred to therein with a view to improving their floating capabilities and submit a report on the subject.

(By order)

R. Narasimha Ayyangar,
Under Secretary to Government.

To the Superintending Engineer, IV Circle.

III

Letter from P. HAWKINS, Esq., M. INST. C.E., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated Coimbatore, the 11th August 1922, No. 239-I.

With reference to your Memorandum No. 1589/21-I.B.-1, dated 7th September 1921, I have the honour to forward herewith the marginally-noted five estimates aggregating to Rs. 5,88,500 together with a preliminary report submitted by the Subdivisional Officer and a tracing. On the basis of the standard of clearance adopted the Kumaradhari and Gundia rivers can be cleared fairly easily while the others would be expensive.

	Rs.
(1) Blasting rock and clearing obstructions in the Kallaja hole	5,000
(2) Blasting rock and clearing obstructions in the Kumaradhari hole	1,90,000
(3) Blasting rock and clearing obstructions in the Gundia hole	33,000
(4) Blasting rock and clearing obstructions in the Netravati river	3,55,000
(5) Blasting rock and clearing obstructions in the Shisla hole	5,500

The amount of clearance which the Forest department would require is, however, not quite certain. Much would depend upon the season of the year at which their rafting operations would be undertaken. I have instructed the Executive Engineer to consult the Forest department on this point with a view to fix the level down to which a channel should be cleared, and am also consulting the Conservator of Forests, Sixth Circle.

I am sending you separately a report of progress on the Paishwani river, which has been satisfactory.

ENCLOSURES

(1)

Letter from the Assistant Engineer, South Kanara subdivision, dated the 10th July 1922, No. 738-E.

Report on floating capabilities of certain rivers in Uppinangadi taluk.

I submit herewith the report received from Overseer M.R.Ry. S. Nanjunda Ayyar on the investigation of the four rivers specified in the letter from the Conservator of Forests, Sixth Circle. I regret I had no opportunity to examine the rivers which I wished to do after the receipt of his report, but having to attend to the Paishwani river work he could not submit it earlier. It is now too late to examine the rivers owing to freshes.

2. To enable the floating of timber the rivers have to be improved at a prohibitive cost—approximate estimates are attached :—

(1) (*a*) Kallaja hole for a length of 9 miles above its junction with the Kumaradhari—Rs. 5,000.

This was included in the investigation as decided by the Chief Conservator of Forests during the conference held in December last.

(*b*) The Kumaradhari from the infall of Kallaja hole down to Uppinangadi—about 32 miles—Rs. 1,90,000.

(2) The Gundia from Gundia down to its junction with the Kumaradhari—length about 16 miles—Rs. 33,000.

(3) The Netravati and its affluent Charmadi hole from Charmadi down to Panemangalore—Rs. 3,55,000.

The portion between Uppinangadi and Panemangalore which will cost about Rs. 20,000 was included as decided at the conference. This will be necessary in case the Kumaradhari alone is to be improved.

(4) The Shisla from Shisla to Parasurama devasthanam—a distance of about 8 miles—Rs. 5,500.

Below Parasurama devasthanam it will not be possible to float timber since at Parapikallu obstruction the river has a sudden fall of 20 feet, and below the river runs in deep and rocky gorges with zig-zag course and sudden drops with right angle bend at every fall for a length of about 3½ miles. Even if it be possible to improve the river the cost will be too prohibitive. Therefore the portion below Parasurama devasthanam has been omitted. Timber may be floated down from Shisla to the above point whence it may be carted to 37 miles on Shiradi road. From there it can be sent down the Netravati.

(5) The obstructions in items 1 (*a*), 2 and 4 are in no way formidable.

Item 1 (*b*)—*Kumaradhari.*—At Yakkadka, below the junction of Gundia and at Viramangila there are drops in the river of 5′ to 6′; the river course is very zig-zag, the bed very rocky. Also commencing from Narimogaru down to the junction with the Netravati the river has rocky bed with projecting boulders with winding and zig-zag course, deep and rapid gorges and drops.

Item 3—*Netravati.*—At Arbi obstruction about a mile below the Dharmasthala road crossing the river has a sudden fall of 15′ to 20′ and runs in deep rocky gorges with zig-zag course for a length of about 2 miles. There are similar difficult obstructions (1) about half a mile above Dharmasthala road crossing, (2) below the junction of Beltangadi hole (3) beyond Uppinangadi to the west, viz., Shripadi obstruction, (4) at Bantwal. But the worst of these is the one at Arbi.

(6) Considering the prohibitive cost of improvement of these rivers, Netravati in particular, the improvement of this river from Charmadi down to 37 miles on Shiradi road may be altogether dropped.

The cost of improvement to the Netravati below 37 miles on Shiradi road will be about Rs. 28,000.

(7) The estimates allow for clearing a channel 20′ wide to enable timber being floated. The rate allowed is the same as that for Paishwani river work.

(8) The six atlas sheets received with No. 949-S.K., dated 21st December 1921, are herewith returned.

(2)

General report to accompany the estimates for blasting rock and clearing obstructions in the rivers in Uppinangadi taluk.

[Amount of all estimates Rs. 5,88,500.]

These have been prepared as per reference from the Chief Conservator of Forests in his No. 298/20-2, dated 20th August 1921, requesting to inspect all the rivers in Uppinangadi taluk regarding their floating capabilities bearing Public Works Department Memorandum No. 1589/21-I.B.-1, dated 7th September 1921.

All the rivers as per the reference of the Conservator of Forests have been investigated by me with the help of Forest Guards guiding me along the margin, and estimates have been prepared for all the rivers except one, i.e., Shisla hole for which an estimate has been prepared till Parasurama Devasthanam and beyond Parasurama Devasthanam it is not possible to float since at Parapikallu where the river falls vertically by 20 feet and from there the river goes in deep gorges with steep rocky margin and with right-angular turnings at every fall. Below this Parapi for a length of 3½ miles the river goes in rocky gorges with many bed falls and zig-zag turnings. So the portion from Parasurama Devasthanam up to the junction with Netravati has been left out and the timber can easily be carted on road from Parasurama Devasthanam up to 37th mile on Siradi road and then floated in the Netravati.

Kallaje hole.—There are not much obstructions in the river except at few places and that too not difficult ones.

Kumaradhari.—The difficult portions are at (1) Yekkada, (2) below the junction with Gundia, (3) Viramangila, (4) Narimogaru commencement up to junction with Netravati.

Gundia hole.—There are only very few difficult obstructions in this river.

Netravati river.—The difficult portions are (1) half a mile above Dharmastala road crossing, (2) one mile below Dharmastala road crossing known as Arbi obstruction, (3) below the junction with Beltangadi hole, (4) Shripadi obstruction, (5) Bantwal obstruction.

Of all the above obstructions, Arbi obstruction is one of the difficult ones where the water falls vertically from 15 feet height and below for a length of two miles the river goes in rocky beds with zig-zag turnings and also with bed falls here and there.

Shisla hole.—There are not much rock from Shisla down to Parasurama devasthanam but there are lot of temporary dams built across the river for irrigation purposes.

The estimate provides for blasting rock and removing the same and also for erecting sheds for work people and storing materials tools and plants, etc. The rate allowed for in the estimate is as for Paishwani works in progress.

(3)

Endorsement by the Executive Engineer, West Coast division, No. 828-S.E., dated 20th July 1922.

Forwarded to Superintending Engineer, IV Circle, with maps showing the different names of the rivers dealt with. I have not been able to make any inspection of the rivers personally and inspection before the end of the monsoon would be useless. But from the Subdivisional Officer's report which is very clear, it seems that the Kumaradari river and the Gundia can be improved at a reasonable cost. While with regard to the others the cost seems prohibitive. Inspection will be possible probably about November or December next and I will then submit a further report if you think it necessary.

NOTES CONNECTED WITH G.O. No. 1456, DEVELOPMENT, DATED 4TH NOVEMBER 1922.

[SUBJECT.—*South Kanara forests—Examination of the rivers for forest exploitation.*]

From the Chief Conservator of Forests, Ref. No. 298-20-2, *dated the 20th August* 1921.

Please see the Chief Conservator's letter. Submitted that the Public Works Department (Irrigation) may be requested to issue orders for examining the four rivers mentioned in Mr. Tireman's letter dated 18th July 1921 with a view to improving their floating capabilities.

R.V.—30-8-21. K. NAGESWARA RAO—2-9-21.
J. M. TURING—2-9-21.

PUBLIC WORKS (IRRIGATION) DEPARTMENT.

Please see the letter from the Chief Conservator of Forests and the Development Department note above. A copy of the letter with its enclosures may be sent to the Superintending Engineer, IV Circle, for report of the floating capabilities of the four rivers mentioned therein. A draft endorsement to the Superintending Engineer is accordingly submitted for approval and orders for issue. The Superintending Engineer will be reminded after two months.

T.S.R.—6-9-21. R. NARASIMHA AYYANGAR—7-9-21.
A. H. MORIN—2-9-21.

[Memorandum No. 1589/21 I.B., dated 7th September 1921.]

From the Superintending Engineer, IV Circle, No. 239 *I., dated* 11*th August* 1922.

Submitted for orders if the estimates submitted by the Superintending Engineer may be examined in Technical section. No preliminary report has been received with the estimates These estimates were called for with reference to paragraphs 2 and 3 of the letter from the Chief Conservator of Forests. If it is not considered necessary to check the estimates, the file may be sent to the Development Department for remarks as to further action to be taken.

T.S.R.—15-8-22.

The preliminary report which is missing may be called for.

R.N.—13-8-22. A.H.M.—15-8-22.

A draft memorandum to the Superintending Engineer, IV Circle, calling for the missing preliminary report for the work is submitted for approval.

2. A report of the progress of work on the Paishwani river promised by the Superintending Engineer in his letter No. 239 I., dated 11th August 1922, has now been received and is put up in the linked file.

G.V.—22-8-22. R.N.—22-8-22.

The file may be sent to Development for remarks. The cost seems to be prohibitive.

N.—5-9-22. A.H.M.—5-9-22

DEVELOPMENT DEPARTMENT.

Last year the Chief Conservator requested that the Public Works Department may be asked to make an examination of certain rivers in the South Kanara district with a view to improving their floating capabilities. This formed part of a scheme which the Chief Conservator had on hand for the development of South Kanara forests. The rivers have been examined by the Public Works Department who reported that the estimated cost of improving them is Rs. 5,88,500.

2. The Chief Conservator has since submitted his report on the development of South Kanara forests and he has been informed that the scheme is too ambitious and that it should lie over until the exploitation branch is in a position to tackle it. Perhaps the proposal in this file may also lie over for the present.

The file may be sent to the Chief Conservator for perusal with the concurrence of the Public Works Department.

S.R.R —11-9-22. K. NAGESWARA RAO—12-9-22.

H. G. STOKES—13-9-22.

OFFICE OF THE CHIEF CONSERVATOR OF FORESTS.

The cost of the larger schemes is so great that there is no use proceeding further with them until the new Engineering branch has had an opportunity of examining the whole project for exploiting the Kanara forests.

2. Meanwhile the comparatively cheap scheme for the improvement of the Netravati below 37/0 miles on the Shiradi road should be proceeded with. This will cost about Rs. 28,000. A fair quantity of timber is extracted from 37/0 miles on the Shiradi road. At present there is no very great difficulty in floating this timber with the help of bamboos, but the bamboos are fast dying and in another year or two there will be none left. If extraction of timber is to go on it will be necessary to float it with the help of boats, the logs being lashed alongside on both sides. This cannot be done unless the existing passages through the rocks are widened. If the work of improving the reach in question is done a much larger quantity of timber can be extracted than is dealt with now, and the cost (Rs. 28,000) will soon be recouped.

H. TIREMAN—3-10-22.

EVELOPMENT DEPARTMENT.

The Chief Conservator's proposal may be supported and the file passed on to Public Works Department. It is believed that the necessary funds will be provided for in that department's budget.

K.N.R.—10-10-22.

The proposals in this file relate to a suggestion made in 1921 by the Chief Conservator of Forests that certain rivers in the Uppinangadi taluk in South Kanara should be investigated with a view to clearing the obstructions in their course, in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation of the rivers has been made under the orders of the Public Works Department but I observe that no officer higher than an overseer has made the investigation or has inspected the rivers. The total cost is put down at Rs. 5,88,500. It is distributed as follows :—

	RS.
(1) On the Kumaradhari river two schemes—one at Rs. 5,000 and the other at Rs. 1,90,000	1,95,000
(2) On the Gudia river	33,000
(3) The Netravati	3,55,000
(4) The Shishla river	5,500
Total ...	5,88,500

The Chief Conservator of Forests recommends in his note of 3rd October 1922 that only one portion, namely, on the Netravati from a point on the Shiradi road at the 37th mile downwards should be undertaken at a cost of Rs. 28,000.

2. In my opinion no money should be spent upon these works at all, until the whole question of the exploiting of these forests on a commercial scale has been gone into by the special staff under the Chief Forest Engineer and staff whom we expect in 1923–24. C-4 will remember that we have declined to include in the budget for 1923–24 an ambitious scheme of expenditure for the exploitation of these forests which Mr. Tireman proposed to include in the budget and until the prospects of that scheme are adequately investigated by the expert lumbering staff, I consider that money should not be spent upon interference with these rivers. It is, of course, out of question for financial reasons to embark upon an expenditure so extravagant as Rs. 5,88,500 which is now indicated. A further reason which renders it desirable in my opinion that we should not interfere with these rivers until we have had the benefit of the examination of the question by the special lumbering engineers, is that there is some reason to doubt whether in schemes of this kind it is sufficient simply to clear away the obstructions and provide a clear run through for the rafts which have to descend the stream. Since 1920 the Public Works Department has been at work in clearing the Paishwani river which, I believe, is the river which flows from the Nilambur area, an estimate of Rs. 34,900 having been sanctioned in that year. I have been informed orally by Mr. Tireman that the principal effect of these operations (I presume by increasing the rapidity of the run off of the river) has been to reduce the average level of the water in it so as to render the rafting of timber very much more difficult than before. If that is correct, it would seem that the clearance of these streams is by no means so simple a matter as might have been supposed and probably requires very much more close investigation and more specialised knowledge than the Public Works Department have yet been able to bring to bear upon it. In any case, the investigation by an overseer does not appear to me to be a satisfactory basis upon which to embark upon a matter of this kind. I consider therefore that the Chief Conservator should be told that the operations on these river beds must await the investigation of the Chief Forest Engineer and the development of the scheme for exploiting the Kanara jungles and I think we must call for a report from him as to the effect of the similar operations which have been undertaken in the Paishwani.

H. G. STOKES—11–10–22.

I quite agree.

A. R. K[NAPP]—15–10–22.

A draft order is submitted for approval. It may be sent to the Public Works Department for acceptance.

S.R.R.—17–10–22.

K. NAGESWARA RAO—18–10–22.

G.S.—20–10–22.

PUBLIC WORKS (IRRIGATION) DEPARTMENT.

The draft order may be accepted in this department and the file returned to Development.

T.S.R.—24–10–22.

R. NARASIMHA AYYANGAR—24–10–22.

A. H. MORIN—30–10–22.

DEVELOPMENT DEPARTMENT.

The draft order put up may issue.

K.N.R.—2–11–22. H.G.S.—3–11–22.

[G.O. No. 1456, Development, dated 4th November 1922.]

Government of Madras

DEVELOPMENT DEPARTMENT

G.O. No. 1456, 4th November 1922

Forests—South Kanara district—Rivers—Floating facilities—Investigation—Dropped.

READ—the following papers:—

I

Letter from S. Cox, Esq., C.I.E., I.F.S., Chief Conservator of Forests, to the Secretary to Government, Development Department, dated Madras, the 20th August 1921, Ref. No. 298/20-2.

I have the honour to submit herewith for the orders of Government copy of a report, dated 18th July 1921, from the Conservator of Forests, Sixth Circle, proposing an examination of the main rivers in the South Kanara district with a view to improving their floating capabilities.

2. In this connexion reference is solicited to Mr. Tireman's report No. 517, dated 17th February 1920 (copy enclosed) on the scheme for development of the South Kanara forests. One of the proposals made by Mr. Tireman was that steps should be taken to facilitate floating, in the Kumharadari and Paishwani rivers. Government have already sanctioned an estimate for Rs. 4,000 for blasting and clearing obstructions in the Paishwani river—vide G.O. No. 369 I., dated 20th November 1920. Mr. Tireman now requests that orders may be issued for an examination of four other rivers in the ensuing dry weather, so that necessary works may be undertaken in due course to render these rivers also navigable for timber rafts. Should Government see no objection I request that orders may be issued to the Public Works Department to undertake an examination and report the result.

3. Mr. Tireman's report on the development of South Kanara forests referred to above, was informally discussed by the Executive Council in May 1920 and the proposals received general assent; but I refrained from placing them formally before Government until I was able to spare an officer for special duty to prepare a forest project for the whole district, a work which would take several months to complete. Mr. Tireman now hopes that with the help of the Forest Utilization Officer he will be able to prepare a scheme himself during the coming cold weather. Meanwhile, I request that orders may be issued for an examination of the rivers in the manner indicated by the Conservator.

ENCLOSURES

(i)

Letter from the Conservator of Forests, Sixth Circle, Ootacamund, to the Chief Conservator of Forests, dated Ootacamund, the 18th July 1921, No. Ref. M. 344/21-1.

In connexion with my proposals for the development of the South Kanara forests (vide my C. No. 517/20-1, dated 17th February 1920) it will be necessary to examine the main rivers in that district with a view to improving their floating capabilities and I request that Government may be addressed with a view to such an examination being commenced during the ensuing dry weather. The following rivers will require examination:—

(1) The Kumaradhari river from the junction of the Kallajo and Adi-Holes to Uppinangadi about thirty-two miles.

(2) The Gundia river from Gundia to its junction with No. 1 about sixteen miles.

(3) The Netravati river and its affluent the Charmadi river from Charmadi to Uppinangadi about twenty-four miles

(4) The Shishla river from Shishla to its junction with No. 3 about fifteen miles.

These four rivers are in the Uppinangadi taluk. There are several in the more northern taluks, but before I ask for their examination I should prefer to see something of the country. The examination of the four rivers named will probably be as much as can be done in one season.

(ii)

Letter from the Conservator of Forests, Western Circle, Coimbatore, to the Chief Conservator of Forests, dated Coimbatore, the 17th February 1920, No. 517.

I have the honour to report that I have now seen a fair proportion of the forests in the South Mangalore Division and to put forward the following proposals for their future treatment. The object of my two visits —one to the Paishwani river valley, and the other to the forests in the basin of the Netravati on the Mangalore–Shiradi road—was to ascertain whether there was any prospect of a big scheme of exploitation. This may at once be ruled out of the question as the forests have almost all been subjected to kumri in the not very distant past, and are on the whole of poor quality. Small patches of very fine evergreen forest do exist having evidently escaped kumri, and there are also patches containing deciduous timber of large size which presumably have not been kumried for a long period of years. Mr. W. C. Hart, Extra Assistant Conservator of Forests, who, a few years ago, was engaged in preparing working-plans for the forests of Paishwani and Kumharadari valleys examined these patches both evergreen and deciduous in some detail and estimated their extent at about 17,000 acres. He further estimated that the over-mature stock therein amounted to something like 120,000 tons of timber; making due allowance for over-sanguine estimates, if only these patches formed one or two compact blocks it would be possible to embark on a big scheme of exploitation, but unfortunately they are scattered over something like 250,000 acres and are for the most part of small extent, the largest measuring about 4,000 acres. Concentration, with which alone any exploitation scheme on a large scale would be profitable, is thus out of the question, and a further adverse feature is the fact that the patches are not all situated in the same river basin.

2. There are however endless possibilities for the future. The state here possesses a very large and compact area of forest extending over some 250,000 acres. I have no doubt whatever that the greater part if not the whole of this was once covered with magnificent evergreen forest. My reasons for holding this opinion are, firstly that from a careful study of the factors governing the distribution of evergreen and deciduous forest I am convinced that in this climate with an annual rainfall of upwards of 200 inches the forests are always evergreen unless they have been subjected to fire or are situated on very shallow soil, secondly the existence of the evergreen patches referred to above which carry as fine a stand of timber as I have seen in any forest and which in no way differ as regards the factors of the locality from the surrounding country which we know to have been subject to kumri, thirdly the fact that in most of the valleys which, though almost certainly kumried in the past, retain in such a damp climate a considerable quantity of moisture throughout the hot weather, thus escaping the annual fires which sweep over the drier hill sides, the forest is evergreen with occasional large trees of Vateria indica and Hopea vightiana, and lastly the fact that in the forests which have been protected from fire an evergreen undergrowth is gradually spreading under the deciduous trees. Whether I am right or wrong however I think that there can be no doubt that an evergreen crop in this locality is to be preferred to a deciduous one owing to the greater stand of timber, the better quality of evergreen trees as regards soundness, and the fact that an evergreen crop requires less attention than a deciduous one. In parenthesis it would be as well to say that I have seen no land suitable for growing teak.

3. Despite the absence hitherto of much systematic research into the sylviculture of the evergreen species sufficient is known regarding certain species to make it a matter of practical certainty that they can be successfully cultivated in the forest tract under consideration. I refer to Hopea parviflora, Vateria indica, Artocarpus hirsuta and mango. Hopea has been cultivated for generations by the ryots of Kanara, and it has of recent years been sown in several places under a deciduous crop. I have seen several of these sowings and have found only one failure which was due to the choking of the seedlings by a dense growth of Strobilanthus the result of a severe opening of the canopy, and of subsequent absence of attention. Vateria indica is commonly planted or sown in Kanara as an avenue tree, and I have moreover successfully raised it under deciduous shade in Coorg though only on an experimental scale. Artocarpus hirsuta will grow anywhere on the west coast. I have raised it in Coorg in a fairly large scale in the open and on a small scale under shade, and I saw in Kanara some very promising sowings. Mango is one of the easiest trees to grow from seed. A forest composed of these species will be extremely valuable; two of them yield timber of the very first quality which moreover is highly prized in the local markets, while the other two yield excellent box-making timber.

4. There being therefore little doubt as to the possibility of replacing the existing poor stock—consisting chiefly of badly grown Xylia, Terminalia tomentosa and Terminalia paniculata—by the species enumerated above, or of the subsequent value of a crop consisting thereof, I recommend that steps be taken to stock as large an area as possible with them. I cannot specify at present the area which can be dealt with annually, but in order to lose no time I have already given orders that 1,000 acres are to be sown this year and in a short time it should be possible to draw up a definite scheme of working. Sowing is a cheap method, and I see no reason—given sufficient establishment—why we should not eventually restock one-hundredth part of the area (i.e., about 2,500 acres) every year. An inspection of any evergreen forest will show that the species selected come to no harm if the seedlings are left to themselves, and there is thus

no reason why sowing should not proceed in advance of the tending which of course will subsequently be required to establish the young crop. In any case if this view proves to be wrong not much harm will have been done. Later on when we know more about them we can introduce other evergreen species. I would not sow the evergreen crop in places where there is a really good young crop already on the ground of the valuable deciduous species. Such young crops chiefly Xylia occur occasionally in patches.

5. It will be necessary when this is possible to increase the establishment to an extent which will permit of tending the whole of the crop to be sown, i.e., possibly 2,500 acres per annum and of extracting the timber which will be felled in the course of the tending. From experience of similar work in Coorg where, though the old crop is much more valuable, the young crop consisting of teak, rosewood, and Pterocarpus is much more costly to raise, I think it will be found that the timber which will be extracted in the interests of the young crop will more than cover the cost of establishing the latter, even leaving out of account the patches containing fine timber. Including these latter the net result should show a fair profit, and the new crop should thus be established at no cost. To extract the timber at a profit however it is imperative to improve the rivers so as to facilitate floating which at present both in the Kumharadari and Paishwani rivers is very difficult and costly. Mr. Peddie of the Public Works Department has recently prepared an estimate for improving the Paishwani and I recommend that the work should be sanctioned and put in hand during the next dry weather. I also recommend that Government be asked at once to depute an officer to examine the Kumharadari river this dry weather and to submit an estimate for its improvement.

6. When the Paishwani has been improved, and it should be possible to do this before the floating season of 1921 a large quantity of timber can be extracted from the over-mature patches in this valley commencing with the Jalsur East reserved forest where fellings as prescribed in Mr. Hart's working-plan are now in progress, although, owing to the difficulty in floating, the possibility laid down by him cannot be worked up to. He prescribed merely selection fellings. I propose to fell much more heavily and in fact to carry out fellings under the uniform method on the lines of those which you saw in Coorg. Mr. Hart estimates the possibility under his method at about 11,000 tons from about 400 acres. Under the uniform method it should be a good deal more but making allowances for unduly sanguine estimates and retaining Mr. Hart's figure there is ample work to keep the establishment employed for a couple of years or more.

7. In addition to the river training works it will be necessary largely to increase the dragging facilities in the Jalsur East and the other larger areas of good timber. I propose that the American Consulting Forest Engineer should be taken to the Paishwani valley and asked for his opinion, but the country is fairly easy and in the meantime I am in favour of constructing a considerable length of drag paths in the Jalsur East reserved forest in order that large quantities of timber can be dragged down to the Kandaka stream, a tributary of the Paishwani, which skirts the reserve, in time to be floated in the monsoon of 1921. Ranger Swamikutti could, I think, easily carry out the work of aligning these paths, and there is no reason why considerable progress should not be made next monsoon. With a good system of drag paths I foresee no difficulty in dragging by means of elephants and buffaloes or possibly a tractor a much larger quantity of timber than has yet been attempted.

8. I have alluded more than once to the question of establishment. My ideas on the subject are possibly on the large side, but I feel that here we have a property of very great potential value and if the Forest department is to justify its existence it is high time we set about to put that property into the best possible condition and to make two or more trees grow where only one grew before. The existing establishment is based on the works at present in progress. These are chiefly works of exploitation and have been inaugurated from time to time in various localities in a somewhat haphazard manner; no review of the needs of the forests as a whole has ever been undertaken as far as I am aware, nor have proposals on any serious scale ever been made to develop the valuable property aforesaid. I have not yet seen the forests of North Mangalore, but I gather that with the exception of the fuel, catechu and sandalwood reserves of the Coondapoor and Udipi ranges the greater part is in much the same condition as the forests of the South Division and that the area of such forest is about 150,000 acres. We thus have 400,000 acres to deal with, or on a provisional rotation of 100 years 4,000 acres per annum to stock with a young crop and to clear of the existing one. I do not think that one Ranger can deal efficiently with the sowing, tending and fire-protection of more than 500 acres per annum, and as I very roughly estimate that the old crop will yield on the average 12 tons per acre (which means 6,000 tons off 500 acres) I think that another ranger will be required for the exploitation of this quantity of timber. Thus 16 rangers will in the not very distant future be required for the 400,000 acres of timber forest with possibly two more for fuel, catechu, and sandalwood, or 18 in all, as compared with the present establishment of 7. It will also be necessary to form another division, two District Forest Officers each probably dealing with an annual regeneration area of 1,600 acres and the third with one of 800 acres in addition to the fuel, catechu and sandal work. As things are at present it is useless going into the question of the territorial arrangement of the divisions and ranges, nor do I propose to deal with the lower subordinate establishment which will be required. If my proposals are generally accepted the District Forest Officer can work out details.

9. The South Division is very badly off in the matter of buildings; if the work which I am now advocating is to be properly done it will be necessary for forest officers in future to

stay in one place for several days at a time; in the case of the local fund sheds they can never be sure of not being turned out, and these sheds are for the most part miserable affairs and usually located in the most malarious places—presumably in order to obtain water easily. Considerable expenditure therefore will be necessary in order to provide comfortable and healthy quarters for the District Forest Officer, Rangers, Foresters and Guards. Communications also are very inadequate. The good roads all run east and west across the forests and although there is a road running more or less through the forests northwards from Jalsur to near Beltangadi in three sections with a total length of about 50 miles, it is impassable for a motor-car for most of the year, and even for carts for a considerable part of the year. It is essential that we should have a road passable for a car except during heavy floods and I advocate improving this road accordingly. It will also be necessary to construct a number of subsidiary fair weather roads. This would probably cost in all about Rs. 2 lakhs while another sum of about Rs. 1 lakh will be required for buildings. In the North Division which I have not yet seen possibly Rs. 2 lakhs would be required for similar work, while propably Rs. 2 lakhs would be required in both divisions together for river improvement work. The total outlay would thus be in the neighbourhood of Rs. 7 lakhs. This does not make provision for dragpaths and carting roads for extracting timber to the rivers; the country is as a rule fairly easy and these should not cost very much; their cost will moreover be covered almost immediately by the sale-proceeds of the timber extracted. The Rs. 7 lakhs referred to represent a capital investment. My figures are of course very rough; details have to be worked out by the District Forest Officers.

10. Seven lakhs is perhaps a somewhat alarming figure compared with what the department is accustomed to spend, but the district has been starved in the past. The total expenditure in the whole district (North and South Divisions) during the last twenty years has been on roads and bridges Rs. 27,763; on buildings Rs. 58,435; on sowing and planting Rs. 5,154; and on other works of improvement (A. VIII. g) Rs. 17,631; and annual average on works of improving the forest (exclusive of protection from fire) of Rs. 5,449. With expenditure on these lines we are not going to make much progress.

11. On the modest estimate of 12 tons to the acre referred to in paragraph 8 the annual yield obtained by working 4,000 acres per annum would be 48,000 tons. A very low estimate of the net profit obtainable on this is Rs. 10 per ton which means an annual profit of nearly Rs. 5 lakhs; this after paying for the necessary sylvicultural work and establishment (perhaps Rs. 2 lakhs) would in the course of a very few years repay all the capital invested. It must also be remembered that the existing crop is growing larger every year and that the annual yield will thus gradually increase.

12. In the immediate future I propose as outlined in paragraphs 4 to 7 to sow 1,000 acres per annum in the South Division, to render floating in the Kumaradari and Paishwani rivers easy, and to extract as much timber as possible from the Jalsur East reserve. For this at least one additional ranger is required, and the District Forest Officer is now preparing proposals to split the existing unwieldy Uppinangadi range which covers 154,000 acres. I am also giving orders to have 1,000 acres sown this year in the North Division. I also propose to close down the various scattered works such as improvement fellings, climber cuttings and the like which are now proceeding in what I have called a somewhat haphazard manner, and to concentrate all the energies of the division of the new work. Fire protection of the sown area will be a sine qua non and I am calling on the District Forest Officer to submit proposals. As regards the North Division I hope to tour there next year and to work out some definite details as to what is required.

13. If you agree with my views I request that you will put my letter before Government. I think that it should know what a potentiality fine property it possesses in its South Kanara forests and be requested to state whether it is prepared to make the outlay necessary to put that property into order. In any case the outlay is not likely to be more than about Rs. 2 per acre, and this will probably very soon be recouped. My scheme is not—as I had hoped—one which is going to bring in a large return at an early date, but the owner of a forest property must look a long way ahead; in this case the return though long deferred should be a very fine one.

II

Official Memorandum No. 1589/21-I.B.-1, Public Works, dated 7th September 1921.

A copy of the letter from the Chief Conservator of Forests, Reference No. 298–20–2, dated 20th August 1921, together with its enclosure is herewith forwarded to the Superintending Engineer, IV Circle, who is requested to arrange for an early examination of the four rivers referred to therein with a view to improving their floating capabilities and submit a report on the subject.

(By order)

R. Narasimha Ayyangar,
Under Secretary to Government.

To the Superintending Engineer, IV Circle.

III

Letter from P. Hawkins, Esq., M. Inst. c.e., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated Coimbatore, the 11th August 1922, No. 239-I.

With reference to your Memorandum No. 1589/21-I.B.-1, dated 7th September 1921, I have the honour to forward herewith the marginally-noted five estimates aggregating to Rs. 5,88,500 together with a preliminary report submitted by the Subdivisional Officer and a tracing. On the basis of the standard of clearance adopted the Kumaradhari and Gundia rivers can be cleared fairly easily while the others would be expensive.

	Rs.
(1) Blasting rock and clearing obstructions in the Kallaja hole	5,000
(2) Blasting rock and clearing obstructions in the Kumaradhari hole	1,90,000
(3) Blasting rock and clearing obstructions in the Gundia hole	33,000
(4) Blasting rock and clearing obstructions in the Netravati river	3,55,000
(5) Blasting rock and clearing obstructions in the Shisla hole	5,500

The amount of clearance which the Forest department would require is, however, not quite certain. Much would depend upon the season of the year at which their rafting operations would be undertaken. I have instructed the Executive Engineer to consult the Forest department on this point with a view to fix the level down to which a channel should be cleared, and am also consulting the Conservator of Forests, Sixth Circle.

I am sending you separately a report of progress on the Paishwani river, which has been satisfactory.

ENCLOSURES

(1).

Letter from the Assistant Engineer, South Kanara subdivision, dated the 10th July 1922, No. 738-I.

Report on floating capabilities of certain rivers in Uppinangadi taluk.

I submit herewith the report received from Overseer M.R.Ry. S. Nanjunda Ayyar on the investigation of the four rivers specified in the letter from the Conservator of Forests, Sixth Circle. I regret I had no opportunity to examine the rivers which I wished to do after the receipt of his report, but having to attend to the Paishwani river work he could not submit it earlier. It is now too late to examine the rivers owing to freshes.

2. To enable the floating of timber the rivers have to be improved at a prohibitive cost—approximate estimates are attached :—

(1) (*a*) Kallaja hole for a length of 9 miles above its junction with the Kumaradhari—Rs. 5,000.

This was included in the investigation as decided by the Chief Conservator of Forests during the conference held in December last.

(*b*) The Kumaradhari from the infall of Kallaja hole down to Uppinangadi—about 32 miles—Rs. 1,90,000.

(2) The Gundia from Gundia down to its junction with the Kumaradhari—length about 16 miles—Rs. 33,000

(3) The Netravati and its affluent Charmadi hole from Charmadi down to Panemangalore—Rs. 3,55,000.

The portion between Uppinangadi and Panemangalore which will cost about Rs. 20,000 was included as decided at the conference. This will be necessary in case the Kumaradhari alone is to be improved.

(4) The Shisla from Shisla to Parasurama devasthanam—a distance of about 8 miles—Rs. 5,500.

Below Parasurama devasthanam it will not be possible to float timber since at Parapikallu obstruction the river has a sudden fall of 20 feet, and below the river runs in deep and rocky gorges with zig-zag course and sudden drops with right angle bend at every fall for a length of about 3½ miles. Even if it be possible to improve the river the cost will be too prohibitive. Therefore the portion below Parasurama devasthanam has been omitted. Timber may be floated down from Shisla to the above point whence it may be carted to 37 miles on Shiradi road. From there it can be sent down the Netravati.

(5) The obstructions in items 1 (*a*), 2 and 4 are in no way formidable.

Item 1 (*b*)—*Kumaradhari.*—At Yakkadka, below the junction of Gundia and at Viramangila there are drops in the river of 5′ to 6′; the river course is very zig-zag, the bed very rocky. Also commencing from Narimogaru down to the junction with the Netravati the river has rocky bed with projecting boulders with winding and zig-zag course, deep and rapid gorges and drops.

Item 3—*Netravati.*—At Arbi obstruction about a mile below the Dharmasthala road crossing the river has a sudden fall of 15′ to 20′ and runs in deep rocky gorges with zig-zag course for a length of about 2 miles. There are similar difficult obstructions (1) about half a mile above Dharmasthala road crossing, (2) below the junction of Beltangadi hole (3) beyond Uppinangadi to the west, viz., Shripadi obstruction, (4) at Bantwal. But the worst of these is the one at Arbi.

(6) Considering the prohibitive cost of improvement of these rivers, Netravati in particular, the improvement of this river from Charmadi down to 37 miles on Shiradi road may be altogether dropped.

The cost of improvement to the Netravati below 37 miles on Shiradi road will be about Rs. 28,000.

(7) The estimates allow for clearing a channel 20′ wide to enable timber being floated. The rate allowed is the same as that for Paishwani river work.

(8) The six atlas sheets received with No. 949-S.K., dated 21st December 1921, are herewith returned.

(2)

General report to accompany the estimates for blasting rock and clearing obstructions in the rivers in Uppinangadi taluk.

[Amount of all estimates Rs. 5,88,500.]

These have been prepared as per reference from the Chief Conservator of Forests in his No. 298/20-2, dated 20th August 1921, requesting to inspect all the rivers in Uppinangadi taluk regarding their floating capabilities bearing Public Works Department Memorandum No. 1589/21-I.B.-1, dated 7th September 1921.

All the rivers as per the reference of the Conservator of Forests have been investigated by me with the help of Forest Guards guiding me along the margin, and estimates have been prepared for all the rivers except one, i.e., Shisla hole for which an estimate has been prepared till Parasurama Devasthanam and beyond Parasurama Devasthanam it is not possible to float since at Parapikallu where the river falls vertically by 20 feet and from there the river goes in deep gorges with steep rocky margin and with right-angular turnings at every fall. Below this Parapi for a length of 3½ miles the river goes in rocky gorges with many bed falls and zig-zag turnings. So the portion from Parasurama Devasthanam up to the junction with Netravati has been left out and the timber can easily be carted on road from Parasurama Devasthanam up to 37th mile on Siradi road and then floated in the Netravati.

Kallaje hole.—There are not much obstructions in the river except at few places and that too not difficult ones.

Kumaradhari.—The difficult portions are at (1) Yekkada, (2) below the junction with Gundia, (3) Viramangila, (4) Narimogaru commencement up to junction with Netravati.

Gundia hole.—There are only very few difficult obstructions in this river.

Netravati river.—The difficult portions are (1) half a mile above Dharmastala road crossing, (2) one mile below Dharmastala road crossing known as Arbi obstruction, (3) below the junction with Beltangadi hole, (4) Shripadi obstruction, (5) Bantwal obstruction.

Of all the above obstructions, Arbi obstruction is one of the difficult ones where the water falls vertically from 15 feet height and below for a length of two miles the river goes in rocky beds with zig-zag turnings and also with bed falls here and there.

Shisla hole.—There are not much rock from Shisla down to Parasurama devasthanam but there are lot of temporary dams built across the river for irrigation purposes.

The estimate provides for blasting rock and removing the same and also for erecting sheds for work people and storing materials tools and plants, etc. The rate allowed for in the estimate is as for Paishwani works in progress.

(3)

Endorsement by the Executive Engineer, West Coast division, No. 828-S.E., dated 20th July 1922

Forwarded to Superintending Engineer, IV Circle, with maps showing the different names of the rivers dealt with. I have not been able to make any inspection of the rivers personally and inspection before the end of the monsoon would be useless. But from the Subdivisional Officer's report which is very clear, it seems that the Kumaradari river and the Gundia can be improved at a reasonable cost. While with regard to the others the cost seems prohibitive. Inspection will be possible probably about November or December next and I will then submit a further report if you think it necessary.

Order—No. 1456, Development, dated 4th November 1922.

In August 1921 the Chief Conservator of Forests submitted proposals that certain rivers in the Uppinangadi taluk in the South Kanara district should be investigated with a view to clearing the obstructions in their course in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation has been made by the Public Works Department and the total cost has been estimated to be Rs. 5,88,500. The Government consider that the operations on these river beds must await the investigation by the Chief Forest Engineer of the whole scheme for the development of the South Kanara forests.

2. The Chief Conservator of Forests is requested to submit a report as to the effect of similar operations undertaken in the Paishwani river with reference to G.O. No. 369 I., dated 20th November 1920.

(By order of the Governor in Council)

H. G. Stokes,
Acting Secretary to Government.

To the Chief Conservator of Forests.
,, Public Works Department (with estimates and one plan).
,, Publicity Officer.

DEVELOPMENT DEPARTMENT.

NOTES CONNECTED WITH G.O. No. 1456, DEVELOPMENT, DATED 4TH NOVEMBER 1922.

[SUBJECT.—*South Kanara forests—Examination of the rivers for forest exploitation.*]

From the Chief Conservator of Forests, Ref. No. 298-20-2, *dated the* 20*th August* 1921.

Please see the Chief Conservator's letter. Submitted that the Public Works Department (Irrigation) may be requested to issue orders for examining the four rivers mentioned in Mr. Tireman's letter dated 18th July 1921 with a view to improving their floating capabilities

R.V.—30-8-21.

K. NAGESWARA RAO—2-9-21
J. M. TURING—2-9-21

PUBLIC WORKS (IRRIGATION) DEPARTMENT.

Please see the letter from the Chief Conservator of Forests and the Development Department note above. A copy of the letter with its enclosures may be sent to the Superintending Engineer, IV Circle, for report of the floating capabilities of the four rivers mentioned therein. A draft endorsement to the Superintending Engineer is accordingly submitted for approval and orders for issue. The Superintending Engineer will be reminded after two months.

T.S.R.—6-9-21.

R. NARASIMHA AYYANGAR—7-9-21.
A. H. MORIN—2-9-21.

[Memorandum No. 1589/21 I.B., dated 7th September 1921.]

From the Superintending Engineer, IV Circle, No. 239 *I., dated* 11*th August* 1922.

Submitted for orders if the estimates submitted by the Superintending Engineer may be examined in Technical section. No preliminary report has been received with the estimates These estimates were called for with reference to paragraphs 2 and 3 of the letter from the Chief Conservator of Forests. If it is not considered necessary to check the estimates, the file may be sent to the Development Department for remarks as to further action to be taken.

T.S.R.—15-8-22.

The preliminary report which is missing may be called for.

R.N.—13-8-22. A.H.M.—15-8-22

A draft memorandum to the Superintending Engineer, IV Circle, calling for the missing preliminary report for the work is submitted for approval.

2. A report of the progress of work on the Paishwani river promised by the Superintending Engineer in his letter No. 239 I., dated 11th August 1922, has now been received and is put up in the linked file.

G.V.—22-8-22. R.N.—22-8-22.

The file may be sent to Development for remarks. The cost seems to be prohibitive.

R.N.—5-9-22 A.H.M.—5-9-22.

DEVELOPMENT DEPARTMENT.

Last year the Chief Conservator requested that the Public Works Department may be asked to make an examination of certain rivers in the South Kanara district with a view to improving their floating capabilities. This formed part of a scheme which the Chief Conservator had on hand for the development of South Kanara forests. The rivers have been examined by the Public Works Department who reported that the estimated cost of improving them is Rs. 5,88,500.

2. The Chief Conservator has since submitted his report on the development of South Kanara forests and he has been informed that the scheme is too ambitious and that it should lie over until the exploitation branch is in a position to tackle it. Perhaps the proposal in this file may also lie over for the present.

The file may be sent to the Chief Conservator for perusal with the concurrence of the Public Works Department.

S.R.R —11-9-22. K. NAGESWARA RAO—12-9-22.

H. G. STOKES—13-9-22.

OFFICE OF THE CHIEF CONSERVATOR OF FORESTS.

The cost of the larger schemes is so great that there is no use proceeding further with them until the new Engineering branch has had an opportunity of examining the whole project for exploiting the Kanara forests.

2. Meanwhile the comparatively cheap scheme for the improvement of the Netravati below 37/0 miles on the Shiradi road should be proceeded with. This will cost about Rs. 28,000. A fair quantity of timber is extracted from 37/0 miles on the Shiradi road. At present there is no very great difficulty in floating this timber with the help of bamboos, but the bamboos are fast dying and in another year or two there will be none left. If extraction of timber is to go on it will be necessary to float it with the help of boats, the logs being lashed alongside on both sides. This cannot be done unless the existing passages through the rocks are widened. If the work of improving the reach in question is done a much larger quantity of timber can be extracted than is dealt with now, and the cost (Rs. 28,000) will soon be recouped.

H. TIREMAN—3-10-22.

DEVELOPMENT DEPARTMENT.

The Chief Conservator's proposal may be supported and the file passed on to Public Works Department. It is believed that the necessary funds will be provided for in that department's budget.

K.N.R.—10-10-22.

The proposals in this file relate to a suggestion made in 1921 by the Chief Conservator of Forests that certain rivers in the Uppinangadi taluk in South Kanara should be investigated with a view to clearing the obstructions in their course, in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation of the rivers has been made under the orders of the Public Works Department but I observe that no officer higher than an overseer has made the investigation or has inspected the rivers. The total cost is put down at Rs. 5,88,500. It is distributed as follows:—

	RS.
(1) On the Kumaradhari river two schemes—one at Rs. 5,000 and the other at Rs. 1,90,000	1,95,000
(2) On the Gudia river	33,000
(3) The Netravati	3,55,000
(4) The Shishla river	5,500
Total ...	5,88,500

The Chief Conservator of Forests recommends in his note of 3rd October 1922 that only one portion, namely, on the Netravati from a point on the Shiradi road at the 37th mile downwards should be undertaken at a cost of Rs. 28,000.

2. In my opinion no money should be spent upon these works at all, until the whole question of the exploiting of these forests on a commercial scale has been gone into by the special staff under the Chief Forest Engineer and staff whom we expect in 1923-24. C-4 will remember that we have declined to include in the budget for 1923-24 an ambitious scheme of expenditure for the exploitation of these forests which Mr. Tireman proposed to include in the budget and until the prospects of that scheme are adequately investigated by the expert lumbering staff, I consider that money should not be spent upon interference with these rivers. It is, of course, out of question for financial reasons to embark upon an expenditure so extravagant as Rs. 5,88,500 which is now indicated. A further reason which renders it desirable in my opinion that we should not interfere with these rivers until we have had the benefit of the examination of the question by the special lumbering engineers, is that there is some reason to doubt whether in schemes of this kind it is sufficient simply to clear away the obstructions and provide a clear run through for the rafts which have to descend the stream. Since 1920 the Public Works Department has been at work in clearing the Paishwani river which, I believe, is the river which flows from the Nilambur area, an estimate of Rs. 34,900 having been sanctioned in that year. I have been informed orally by Mr. Tireman that the principal effect of these operations (I presume by increasing the rapidity of the run off of the river) has been to reduce the average level of the water in it so as to render the rafting of timber very much more difficult than before. If that is correct, it would seem that the clearance of these streams is by no means so simple a matter as might have been supposed and probably requires very much more close investigation and more specialised knowledge than the Public Works Department have yet been able to bring to bear upon it. In any case, the investigation by an overseer does not appear to me to be a satisfactory basis upon which to embark upon a matter of this kind. I consider therefore that the Chief Conservator should be told that the operations on these river beds must await the investigation of the Chief Forest Engineer and the development of the scheme for exploiting the Kanara jungles and I think we must call for a report from him as to the effect of the similar operations which have been undertaken in the Paishwani.

4

H. G. STOKES—11-10-22.

I quite agree

A. R. K[NAPP]—15-10-22.

A draft order is submitted for approval. It may be sent to the Public Works Department for acceptance.

S.R.R.—17-10-22. K. NAGESWARA RAO—18-10-22.

H.G.S.—20-10-22.

PUBLIC WORKS (IRRIGATION) DEPARTMENT.

The draft order may be accepted in this department and the file returned to Development.

T.S.R.—24-10-22. R. NARASIMHA AYYANGAR—24-10-22.

A. H. MORIN—30-10-22.

DEVELOPMENT DEPARTMENT.

The draft order put up may issue.

K.N.R.—2-11-22. H.G.S.—3-11-22.

[G.O. No. 1456, Development, dated 4th November 1922.]

E 11

Government of Madras

DEVELOPMENT DEPARTMENT

30 NOV 1922

DIRECTOR
27 NOV 1922

G.O. No. 1456, 4th November 1922

Forests—South Kanara district—Rivers—Floating facilities—Investigation—Dropped.

READ—the following papers :—

I

Letter from S. Cox, Esq., C.I.E., I.F.S., Chief Conservator of Forests, to the Secretary to Government, Development Department, dated Madras, the 20th August 1921, Ref. No. 298/20-2.

I have the honour to submit herewith for the orders of Government copy of a report, dated 18th July 1921, from the Conservator of Forests, Sixth Circle, proposing an examination of the main rivers in the South Kanara district with a view to improving their floating capabilities.

2. In this connexion reference is solicited to Mr. Tireman's report No. 517, dated 17th February 1920 (copy enclosed) on the scheme for development of the South Kanara forests. One of the proposals made by Mr. Tireman was that steps should be taken to facilitate floating, in the Kumharadari and Paishwani rivers. Government have already sanctioned an estimate for Rs. 4,000 for blasting and clearing obstructions in the Paishwani river—vide G.O. No. 369 I., dated 20th November 1920. Mr. Tireman now requests that orders may be issued for an examination of four other rivers in the ensuing dry weather, so that necessary works may be undertaken in due course to render these rivers also navigable for timber rafts. Should Government see no objection I request that orders may be issued to the Public Works Department to undertake an examination and report the result.

3. Mr. Tireman's report on the development of South Kanara forests referred to above, was informally discussed by the Executive Council in May 1920 and the proposals received general assent; but I refrained from placing them formally before Government until I was able to spare an officer for special duty to prepare a forest project for the whole district, a work which would take several months to complete. Mr. Tireman now hopes that with the help of the Forest Utilization Officer he will be able to prepare a scheme himself during the coming cold weather. Meanwhile, I request that orders may be issued for an examination of the rivers in the manner indicated by the Conservator.

ENCLOSURE:

(i)

Letter from the Conservator of Forests, Sixth Circle, Ootacamund, to the Chief Conservator of Forests, dated Ootacamund, the 18th July 1921, No. Ref. M. 344/21-1.

In connexion with my proposals for the development of the South Kanara forests (vide my C. No. 517/20-1, dated 17th February 1920) it will be necessary to examine the main rivers in that district with a view to improving their floating capabilities and I request that Government may be addressed with a view to such an examination being commenced during the ensuing dry weather. The following rivers will require examination :—

(1) The Kumaradhari river from the junction of the Kallaje and Adi-Holes to Uppinangadi about thirty-two miles.

(2) The Gundia river from Gundia to its junction with No. 1 about sixteen miles.

(3) The Netravati river and its affluent the Charmadi river from Charmadi to Uppinangadi about twenty-four miles.

(4) The Shishla river from Shishla to its junction with No. 3 about fifteen miles.

These four rivers are in the Uppinangadi taluk. There are several in the more northern taluks, but before I ask for their examination I should prefer to see something of the country. The examination of the four rivers named will probably be as much as can be done in one season.

(ii)

Letter from the Conservator of Forests, Western Circle, Coimbatore, to the Chief Conservator of Forests, dated Coimbatore, the 17th February 1920, No. 517.

I have the honour to report that I have now seen a fair proportion of the forests in the South Mangalore Division and to put forward the following proposals for their future treatment. The object of my two visits—one to the Paishwani river valley, and the other to the forests in the basin of the Netravati on the Mangalore–Shiradi road—was to ascertain whether there was any prospect of a big scheme of exploitation. This may at once be ruled out of the question as the forests have almost all been subjected to kumri in the not very distant past, and are on the whole of poor quality. Small patches of very fine evergreen forest do exist having evidently escaped kumri, and there are also patches containing deciduous timber of large size which presumably have not been kumried for a long period of years. Mr. W. O. Hart, Extra Assistant Conservator of Forests, who, a few years ago, was engaged in preparing working-plans for the forests of Paishwani and Kumharadari valleys examined these patches both evergreen and deciduous in some detail and estimated their extent at about 17,000 acres. He further estimated that the over-mature stock therein amounted to something like 120,000 tons of timber; making due allowance for over-sanguine estimates, if only these patches formed one or two compact blocks it would be possible to embark on a big scheme of exploitation, but unfortunately they are scattered over something like 250,000 acres and are for the most part of small extent, the largest measuring about 4,000 acres. Concentration, with which alone any exploitation scheme on a large scale would be profitable, is thus out of the question, and a further adverse feature is the fact that the patches are not all situated in the same river basin.

2. There are however endless possibilities for the future. The state here possesses a very large and compact area of forest extending over some 250,000 acres. I have no doubt whatever that the greater part if not the whole of this was once covered with magnificent evergreen forest. My reasons for holding this opinion are, firstly that from a careful study of the factors governing the distribution of evergreen and deciduous forest I am convinced that in this climate with an annual rainfall of upwards of 200 inches the forests are always evergreen unless they have been subjected to fire or are situated on very shallow soil, secondly the existence of the evergreen patches referred to above which carry as fine a stand of timber as I have seen in any forest and which in no way differ as regards the factors of the locality from the surrounding country which we know to have been subject to kumri, thirdly the fact that in most of the valleys which, though almost certainly kumried in the past, retain in such a damp climate a considerable quantity of moisture throughout the hot weather, thus escaping the annual fires which sweep over the drier hill sides, the forest is evergreen with occasional large trees of Vateria indica and Hopea vightiana, and lastly the fact that in the forests which have been protected from fire an evergreen undergrowth is gradually spreading under the deciduous trees. Whether I am right or wrong however I think that there can be no doubt that an evergreen crop in this locality is to be preferred to a deciduous one owing to the greater stand of timber, the better quality of evergreen trees as regards soundness, and the fact that an evergreen crop requires less attention than a deciduous one. In parenthesis it would be as well to say that I have seen no land suitable for growing teak.

3. Despite the absence hitherto of much systematic research into the sylviculture of the evergreen species sufficient is known regarding certain species to make it a matter of practical certainty that they can be successfully cultivated in the forest tract under consideration. I refer to Hopea parviflora, Vateria indica, Artocarpus hirsuta and mango. Hopea has been cultivated for generations by the ryots of Kanara, and it has of recent years been sown in several places under a deciduous crop. I have seen several of these sowings and have found only one failure which was due to the choking of the seedlings by a dense growth of Strobilanthus the result of a severe opening of the canopy, and of subsequent absence of attention. Vateria indica is commonly planted or sown in Kanara as an avenue tree, and I have moreover successfully raised it under deciduous shade in Coorg though only on an experimental scale. Artocarpus hirsuta will grow anywhere on the west coast. I have raised it in Coorg in a fairly large scale in the open and on a small scale under shade, and I saw in Kanara some very promising sowings. Mango is one of the easiest trees to grow from seed. A forest composed of these species will be extremely valuable; two of them yield timber of the very first quality which moreover is highly prized in the local markets, while the other two yield excellent box-making timber.

4. There being therefore little doubt as to the possibility of replacing the existing poor stock—consisting chiefly of badly grown Xylia, Terminalia tomentosa and Terminalia paniculata—by the species enumerated above, or of the subsequent value of a crop consisting thereof, I recommend that steps be taken to stock as large an area as possible with them. I cannot specify at present the area which can be dealt with annually, but in order to lose no time I have already given orders that 1,000 acres are to be sown this year and in a short time it should be possible to draw up a definite scheme of working. Sowing is a cheap method, and I see no reason—given sufficient establishment—why we should not eventually restock one-hundredth part of the area (i.e., about 2,500 acres) every year. An inspection of any evergreen forest will show that the species selected come to no harm if the seedlings are left to themselves, and there is thus

no reason why sowing should not proceed in advance of the tending which of course will subsequently be required to establish the young crop. In any case if this view proves to be wrong not much harm will have been done. Later on when we know more about them we can introduce other evergreen species. I would not sow the evergreen crop in places where there is a really good young crop already on the ground of the valuable deciduous species. Such young crops chiefly Xylia occur occasionally in patches.

5. It will be necessary when this is possible to increase the establishment to an extent which will permit of tending the whole of the crop to be sown, i.e., possibly 2,500 acres per annum and of extracting the timber which will be felled in the course of the tending. From experience of similar work in Coorg where, though the old crop is much more valuable, the young crop consisting of teak, rosewood, and Pterocarpus is much more costly to raise, I think it will be found that the timber which will be extracted in the interests of the young crop will more than cover the cost of establishing the latter even leaving out of account the patches containing fine timber. Including these latter the net result should show a fair profit, and the new crop should thus be established at no cost. To extract the timber at a profit however it is imperative to improve the rivers so as to facilitate floating which at present both in the Kumharadari and Paishwani rivers is very difficult and costly. Mr. Peddie of the Public Works Department has recently prepared an estimate for improving the Paishwani and I recommend that the work should be sanctioned and put in hand during the next dry weather. I also recommend that Government be asked at once to depute an officer to examine the Kumharadari river this dry weather and to submit an estimate for its improvement.

6. When the Paishwani has been improved and it should be possible to do this before the floating season of 1921 a large quantity of timber can be extracted from the over-mature patches in this valley commencing with the Jalsur East reserved forest where fellings as prescribed in Mr. Hart's working-plan are now in progress, although, owing to the difficulty in floating, the possibility laid down by him cannot be worked up to. He prescribed merely selection fellings. I propose to fell much more heavily and in fact to carry out fellings under the uniform method on the lines of those which you saw in Coorg. Mr. Hart estimates the possibility under his method at about 11,000 tons from about 400 acres. Under the uniform method it should be a good deal more but making allowances for unduly sanguine estimates and retaining Mr. Hart's figure there is ample work to keep the establishment employed for a couple of years or more.

7. In addition to the river training works it will be necessary largely to increase the dragging facilities in the Jalsur East and the other larger areas of good timber. I propose that the American Consulting Forest Engineer should be taken to the Paishwani valley and asked for his opinion, but the country is fairly easy and in the meantime I am in favour of constructing a considerable length of drag paths in the Jalsur East reserved forest in order that large quantities of timber can be dragged down to the Kandaka stream, a tributary of the Paishwani, which skirts the reserve, in time to be floated in the monsoon of 1921. Ranger Swamikutti could, I think, easily carry out the work of aligning these paths, and there is no reason why considerable progress should not be made next monsoon. With a good system of drag paths I foresee no difficulty in dragging by means of elephants and buffaloes or possibly a tractor a much larger quantity of timber than has yet been attempted.

8. I have alluded more than once to the question of establishment. My ideas on the subject are possibly on the large side, but I feel that here we have a property of very great potential value and if the Forest department is to justify its existence it is high time we set about to put that property into the best possible condition and to make two or more trees grow where only one grew before. The existing establishment is based on the works at present in progress. These are chiefly works of exploitation and have been inaugurated from time to time in various localities in a somewhat haphazard manner; no review of the needs of the forests as a whole has ever been undertaken as far as I am aware, nor have proposals on any serious scale ever been made to develop the valuable property aforesaid. I have not yet seen the forests of North Mangalore, but I gather that with the exception of the fuel, catechu and sandalwood reserves of the Coondapoor and Udipi ranges the greater part is in much the same condition as the forests of the South Division and that the area of such forest is about 150,000 acres. We thus have 400,000 acres to deal with, or on a provisional rotation of 100 years 4,000 acres per annum to stock with a young crop and to clear of the existing one. I do not think that one Ranger can deal efficiently with the sowing, tending and fire-protection of more than 500 acres per annum, and as I very roughly estimate that the old crop will yield on the average 12 tons per acre (which means 6,000 tons off 500 acres) I think that another ranger will be required for the exploitation of this quantity of timber. Thus 16 rangers will in the not very distant future be required for the 400,000 acres of timber forest with possibly two more for fuel, catechu, and sandalwood or 18 in all, as compared with the present establishment of 7. It will also be necessary to form another division, two District Forest Officers each probably dealing with an annual regeneration area of 1,600 acres and the third with one of 800 acres in addition to the fuel, catechu and sandal work. As things are at present it is useless going into the question of the territorial arrangement of the divisions and ranges, nor do I propose to deal with the lower subordinate establishment which will be required. If my proposals are generally accepted the District Forest Officer can work out details.

9. The South Division is very badly off in the matter of buildings; if the work which I am now advocating is to be properly done it will be necessary for forest officers in future to

stay in one place for several days at a time; in the case of the local fund sheds they can never be sure of not being turned out, and these sheds are for the most part miserable affairs and usually located in the most malarious places—presumably in order to obtain water easily. Considerable expenditure therefore will be necessary in order to provide comfortable and healthy quarters for the District Forest Officer, Rangers, Foresters and Guards. Communications also are very inadequate. The good roads all run east and west across the forests and although there is a road running more or less through the forests northwards from Jalsur to near Beltangadi in three sections with a total length of about 50 miles, it is impassable for a motor-car for most of the year, and even for carts for a considerable part of the year. It is essential that we should have a road passable for a car except during heavy floods and I advocate improving this road accordingly. It will also be necessary to construct a number of subsidiary fair weather roads. This would probably cost in all about Rs. 2 lakhs while another sum of about Rs. 1 lakh will be required for buildings. In the North Division which I have not yet seen possibly Rs. 2 lakhs would be required for similar work, while propably Rs. 2 lakhs would be required in both divisions together for river improvement work. The total outlay would thus be in the neighbourhood of Rs. 7 lakhs. This does not make provision for dragpaths and carting roads for extracting timber to the rivers; the country is as a rule fairly easy and these should not cost very much; their cost will moreover be covered almost immediately by the sale-proceeds of the timber extracted. The Rs. 7 lakhs referred to represent a capital investment. My figures are of course very rough; details have to be worked out by the District Forest Officers.

10. Seven lakhs is perhaps a somewhat alarming figure compared with what the department is accustomed to spend, but the district has been starved in the past. The total expenditure in the whole district (North and South Divisions) during the last twenty years has been on roads and bridges Rs. 27,763; on buildings Rs. 58,435; on sowing and planting Rs. 5,154; and on other works of improvement (A. VIII. g) Rs. 17,631; and annual average on works of improving the forest (exclusive of protection from fire) of Rs. 5,449. With expenditure on these lines we are not going to make much progress.

11. On the modest estimate of 12 tons to the acre referred to in paragraph 8 the annual yield obtained by working 4,000 acres per annum would be 48,000 tons. A very low estimate of the net profit obtainable on this is Rs. 10 per ton which means an annual profit of nearly Rs. 5 lakhs; this after paying for the necessary sylvicultural work and establishment (perhaps Rs. 2 lakhs) would in the course of a very few years repay all the capital invested. It must also be remembered that the existing crop is growing larger every year and that the annual yield will thus gradually increase.

12. In the immediate future I propose as outlined in paragraphs 4 to 7 to sow 1,000 acres per annum in the South Division, to render floating in the Kumaradari and Paishwani rivers easy, and to extract as much timber as possible from the Jalsur East reserve. For this at least one additional ranger is required, and the District Forest Officer is now preparing proposals to split the existing unwieldy Uppinangadi range which covers 154,000 acres. I am also giving orders to have 1,000 acres sown this year in the North Division. I also propose to close down the various scattered works such as improvement fellings, climber cuttings and the like which are now proceeding in what I have called a somewhat haphazard manner, and to concentrate all the energies of the division of the new work. Fire protection of the sown area will be a sine qua non and I am calling on the District Forest Officer to submit proposals. As regards the North Division I hope to tour there next year and to work out some definite details as to what is required.

13. If you agree with my views I request that you will put my letter before Government. I think that it should know what a potentiality fine property it possesses in its South Kanara forests and be requested to state whether it is prepared to make the outlay necessary to put that property into order. In any case the outlay is not likely to be more than about Rs. 2 per acre, and this will probably very soon be recouped. My scheme is not—as I had hoped—one which is going to bring in a large return at an early date, but the owner of a forest property must look a long way ahead; in this case the return though long deferred should be a very fine one.

II

Official Memorandum No. 1589/21-I.B.-1, Public Works, dated 7th September 1921.

A copy of the letter from the Chief Conservator of Forests, Reference No. 298–20–2, dated 20th August 1921, together with its enclosure is herewith forwarded to the Superintending Engineer, IV Circle, who is requested to arrange for an early examination of the four rivers referred to therein with a view to improving their floating capabilities and submit a report on the subject.

(By order)

R. Narasimha Ayyangar,
Under Secretary to Government.

To the Superintending Engineer, IV Circle

III

Letter from P. Hawkins, Esq., M. Inst. c.e., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated Coimbatore, the 11th August 1922, No. 239-I.

With reference to your Memorandum No. 1589/21-I.B.-1, dated 7th September 1921, I have the honour to forward herewith the marginally-noted five estimates aggregating to Rs. 5,88,500 together with a preliminary report submitted by the Subdivisional Officer and a tracing. On the basis of the standard of clearance adopted the Kumaradhari and Gundia rivers can be cleared fairly easily while the others would be expensive.

	Rs.
(1) Blasting rock and clearing obstructions in the Kallaja hole	5,000
(2) Blasting rock and clearing obstructions in the Kumaradhari hole	1,90,000
(3) Blasting rock and clearing obstructions in the Gundia hole	33,000
(4) Blasting rock and clearing obstructions in the Netravāti river	3,55,000
(5) Blasting rock and clearing obstructions in the Shisla hole	5,500

The amount of clearance which the Forest department would require is, however, not quite certain. Much would depend upon the season of the year at which their rafting operations would be undertaken. I have instructed the Executive Engineer to consult the Forest department on this point with a view to fix the level down to which a channel should be cleared, and am also consulting the Conservator of Forests, Sixth Circle.

I am sending you separately a report of progress on the Paishwani river, which has been satisfactory.

Enclosures

(1)

Letter from the Assistant Engineer, South Kanara subdivision, dated the 10th July 1922, No. 738-E.

Report on floating capabilities of certain rivers in Uppinangadi taluk.

I submit herewith the report received from Overseer M.R.Ry. S. Nanjunda Ayyar on the investigation of the four rivers specified in the letter from the Conservator of Forests, Sixth Circle. I regret I had no opportunity to examine the rivers which I wished to do after the receipt of his report, but having to attend to the Paishwani river work he could not submit it earlier. It is now too late to examine the rivers owing to freshes.

2. To enable the floating of timber the rivers have to be improved at a prohibitive cost—approximate estimates are attached :—

(1) (*a*) Kallaja hole for a length of 9 miles above its junction with the Kumaradhari—Rs. 5,000.

This was included in the investigation as decided by the Chief Conservator of Forests during the conference held in December last.

(*b*) The Kumaradhari from the infall of Kallaja hole down to Uppinangadi—about 32 miles—Rs. 1,90,000.

(2) The Gundia from Gundia down to its junction with the Kumaradhari—length about 16 miles—Rs. 33,000.

(3) The Netravati and its affluent Charmadi hole from Charmadi down to Panemangalore—Rs. 3,55,000.

The portion between Uppinangadi and Panemangalore which will cost about Rs. 20,000 was included as decided at the conference. This will be necessary in case the Kumaradhari alone is to be improved.

(4) The Shisla from Shisla to Parasurama devasthanam—a distance of about 8 miles—Rs. 5,500.

Below Parasurama devasthanam it will not be possible to float timber since at Parapikallu obstruction the river has a sudden fall of 20 feet, and below the river runs in deep and rocky gorges with zig-zag course and sudden drops with right angle bend at every fall for a length of about 3½ miles. Even if it be possible to improve the river the cost will be too prohibitive. Therefore the portion below Parasurama devasthanam has been omitted. Timber may be floated down from Shisla to the above point whence it may be carted to 37 miles on Shiradi road. From there it can be sent down the Netravati.

(5) The obstructions in items 1 (*a*), 2 and 4 are in no way formidable.

Item 1 (*b*)—*Kumaradhari.*—At Yakkadka, below the junction of Gundia and at Viramangila there are drops in the river of 5′ to 6′; the river course is very zig-zag, the bed very rocky. Also commencing from Narimogaru down to the junction with the Netravati the river has rocky bed with projecting boulders with winding and zig-zag course, deep and rapid gorges and drops.

Item 3—*Netravati.*—At Arbi obstruction about a mile below the Dharmasthala road crossing the river has a sudden fall of 15′ to 20′ and runs in deep rocky gorges with zig-zag course for a length of about 2 miles. There are similar difficult obstructions (1) about half a mile above Dharmasthala road crossing, (2) below the junction of Beltangadi hole (3) beyond Uppinangadi to the west, viz., Shripadi obstruction, (4) at Bantwal. But the worst of these is the one at Arbi.

(6) Considering the prohibitive cost of improvement of these rivers, Netravati in particular, the improvement of this river from Charmadi down to 37 miles on Shiradi road may be altogether dropped.

The cost of improvement to the Netravati below 37 miles on Shiradi road will be about Rs. 28,000.

(7) The estimates allow for clearing a channel 20′ wide to enable timber being floated. The rate allowed is the same as that for Paishwani river work.

(8) The six atlas sheets received with No. 949-S.K., dated 21st December 1921, are herewith returned.

(2)

General report to accompany the estimates for blasting rock and clearing obstructions in the rivers in Uppinangadi taluk.

[Amount of all estimates Rs. 5,88,500.]

These have been prepared as per reference from the Chief Conservator of Forests in his No. 298/20–2, dated 20th August 1921, requesting to inspect all the rivers in Uppinangadi taluk regarding their floating capabilities bearing Public Works Department Memorandum No. 1589/21-I.B.-1, dated 7th September 1921.

All the rivers as per the reference of the Conservator of Forests have been investigated by me with the help of Forest Guards guiding me along the margin, and estimates have been prepared for all the rivers except one, i.e., Shisla hole for which an estimate has been prepared till Parasurama Devasthanam and beyond Parasurama Devasthanam it is not possible to float since at Parapikallu where the river falls vertically by 20 feet and from there the river goes in deep gorges with steep rocky margin and with right-angular turnings at every fall. Below this Parapi for a length of $3\frac{1}{2}$ miles the river goes in rocky gorges with many bed falls and zig-zag turnings. So the portion from Parasurama Devasthanam up to the junction with Netravati has been left out and the timber can easily be carted on road from Parasurama Devasthanam up to 37th mile on Siradi road and then floated in the Netravati.

Kallaje hole.—There are not much obstructions in the river except at few places and that too not difficult ones.

Kumaradhari.—The difficult portions are at (1) Yekkada, (2) below the junction with Gundia, (3) Viramangila, (4) Narimogaru commencement up to junction with Netravati

Gundia hole.—There are only very few difficult obstructions in this river.

Netravati river.—The difficult portions are (1) half a mile above Dharmastala road crossing, (2) one mile below Dharmastala road crossing known as Arbi obstruction, (3) below the junction with Beltangadi hole, (4) Shripadi obstruction, (5) Bantwal obstruction.

Of all the above obstructions, Arbi obstruction is one of the difficult ones where the water falls vertically from 15 feet height and below for a length of two miles the river goes in rocky beds with zig-zag turnings and also with bed falls here and there.

Shisla hole.—There are not much rock from Shisla down to Parasurama devasthanam but there are lot of temporary dams built across the river for irrigation purposes.

The estimate provides for blasting rock and removing the same and also for erecting sheds for work people and storing materials tools and plants, etc. The rate allowed for in the estimate is as for Paishwani works in progress.

(3)

Endorsement by the Executive Engineer, West Coast division, No. 828-*S.E., dated* 20*th July* 1922.

Forwarded to Superintending Engineer, IV Circle, with maps showing the different names of the rivers dealt with. I have not been able to make any inspection of the rivers personally and inspection before the end of the monsoon would be useless. But from the Subdivisional Officer's report which is very clear, it seems that the Kumaradari river and the Gundia can be improved at a reasonable cost. While with regard to the others the cost seems prohibitive. Inspection will be possible probably about November or December next and I will then submit a further report if you think it necessary.

Order—No. 1456, Development. dated 4th November 1922.

In August 1921 the Chief Conservator of Forests submitted proposals that certain rivers in the Uppinangadi taluk in the South Kanara district should be investigated with a view to clearing the obstructions in their course in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation has been made by the Public Works Department and the total cost has been estimated to be Rs. 5,88,500. The Government consider that the operations on these river beds must await the investigation by the Chief Forest Engineer of the whole scheme for the development of the South Kanara forests.

2. The Chief Conservator of Forests is requested to submit a report as to the effect of similar operations undertaken in the Paishwani river with reference to G.O. No. 1369 I., dated 20th November 1920.

(By order of the Governor in Council)

H. G. STOKES,
Acting Secretary to Government.

To the Chief Conservator of Forests.
" Public Works Department (with estimates and one plan).
" Publicity Officer.

DEVELOPMENT DEPARTMENT.

NOTES CONNECTED WITH G.O. No. 1456, DEVELOPMENT, DATED 4TH NOVEMBER 1922.

[SUBJECT.—*South Kanara forests—Examination of the rivers for forest exploitation.*]

From the Chief Conservator of Forests, Ref. No. 298-20-2, *dated the 20th August* 1921.

Please see the Chief Conservator's letter. Submitted that the Public Works Department (Irrigation) may be requested to issue orders for examining the four rivers mentioned in Mr. Tireman's letter dated 18th July 1921 with a view to improving their floating capabilities.

R.V.—30-8-21

K. NAGESWARA RAO—2-9-21.

J. M. TURING—2-9-21.

PUBLIC WORKS (IRRIGATION) DEPARTMENT.

Please see the letter from the Chief Conservator of Forests and the Development Department note above. A copy of the letter with its enclosures may be sent to the Superintending Engineer, IV Circle, for report of the floating capabilities of the four rivers mentioned therein. A draft endorsement to the Superintending Engineer is accordingly submitted for approval and orders for issue. The Superintending Engineer will be reminded after two months.

T.S.R.—6-9-21.

R. NARASIMHA AYYANGAR—7-9-21.

A. H. MORIN—2-9-21.

[Memorandum No. 1589/21 I.B., dated 7th September 1921.]

From the Superintending Engineer, IV Circle, No. 239 *I., dated* 11*th August* 1922.

Submitted for orders if the estimates submitted by the Superintending Engineer may be examined in Technical section. No preliminary report has been received with the estimates These estimates were called for with reference to paragraphs 2 and 3 of the letter from the Chief Conservator of Forests. If it is not considered necessary to check the estimates, the file may be sent to the Development Department for remarks as to further action to be taken.

T.S.R.—15-8-22.

The preliminary report which is missing may be called for.

R.N.—13-8-22. A.H.M.—15-8-22.

A draft memorandum to the Superintending Engineer, IV Circle, calling for the missing preliminary report for the work is submitted for approval.

2. A report of the progress of work on the Paishwani river promised by the Superintending Engineer in his letter No. 239 I., dated 11th August 1922, has now been received and is put up in the linked file.

G.V.—22-8-22. R.N.—22-8-22.

The file may be sent to Development for remarks. The cost seems to be prohibitive.

R.N.—5-9-22. A.H.M.—5-9-22

DEVELOPMENT DEPARTMENT.

Last year the Chief Conservator requested that the Public Works Department may be asked to make an examination of certain rivers in the South Kanara district with a view to improving their floating capabilities. This formed part of a scheme which the Chief Conservator had on hand for the development of South Kanara forests. The rivers have been examined by the Public Works Department who reported that the estimated cost of improving them is Rs. 5,88,500.

2. The Chief Conservator has since submitted his report on the development of South Kanara forests and he has been informed that the scheme is too ambitious and that it should lie over until the exploitation branch is in a position to tackle it. Perhaps the proposal in this file may also lie over for the present.

The file may be sent to the Chief Conservator for perusal with the concurrence of the Public Works Department.

S.R.R —11-9-22. K. NAGESWARA RAO—12-9-22.

H. G. STOKES—13-9-22.

OFFICE OF THE CHIEF CONSERVATOR OF FORESTS.

The cost of the larger schemes is so great that there is no use proceeding further with them until the new Engineering branch has had an opportunity of examining the whole project for exploiting the Kanara forests.

2. Meanwhile the comparatively cheap scheme for the improvement of the Netravati below 37/0 miles on the Shiradi road should be proceeded with. This will cost about Rs. 28,000. A fair quantity of timber is extracted from 37/0 miles on the Shiradi road. At present there is no very great difficulty in floating this timber with the help of bamboos, but the bamboos are fast dying and in another year or two there will be none left. If extraction of timber is to go on it will be necessary to float it with the help of boats, the logs being lashed alongside on both sides. This cannot be done unless the existing passages through the rocks are widened. If the work of improving the reach in question is done a much larger quantity of timber can be extracted than is dealt with now, and the cost (Rs. 28,000) will soon be recouped.

H. TIREMAN—3-10-22.

DEVELOPMENT DEPARTMENT.

The Chief Conservator's proposal may be supported and the file passed on to Public Works Department. It is believed that the necessary funds will be provided for in that department's budget.

K.N.R.—10-10-22.

The proposals in this file relate to a suggestion made in 1921 by the Chief Conservator of Forests that certain rivers in the Uppinangadi taluk in South Kanara should be investigated with a view to clearing the obstructions in their course, in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation of the rivers has been made under the orders of the Public Works Department but I observe that no officer higher than an overseer has made the investigation or has inspected the rivers. The total cost is put down at Rs. 5,88,500. It is distributed as follows :—

	Rs.
(1) On the Kumaradhari river two schemes—one at Rs. 5,000 and the other at Rs. 1,90,000	1,95,000
(2) On the Gudia river	33,000
(3) The Netravati	3,55,000
(4) The Shishla river	5,500
Total ...	5,88,500

The Chief Conservator of Forests recommends in his note of 3rd October 1922 that only one portion, namely, on the Netravati from a point on the Shiradi road at the 37th mile downwards should be undertaken at a cost of Rs. 28,000.

2. In my opinion no money should be spent upon these works at all, until the whole question of the exploiting of these forests on a commercial scale has been gone into by the special staff under the Chief Forest Engineer and staff whom we expect in 1923-24. C-4 will remember that we have declined to include in the budget for 1923-24 an ambitious scheme of expenditure for the exploitation of these forests which Mr. Tireman proposed to include in the budget and until the prospects of that scheme are adequately investigated by the expert lumbering staff, I consider that money should not be spent upon interference with these rivers. It is, of course, out of question for financial reasons to embark upon an expenditure so extravagant as Rs. 5,88,500 which is now indicated. A further reason which renders it desirable in my opinion that we should not interfere with these rivers until we have had the benefit of the examination of the question by the special lumbering engineers, is that there is some reason to doubt whether in schemes of this kind it is sufficient simply to clear away the obstructions and provide a clear run through for the rafts which have to descend the stream. Since 1920 the Public Works Department has been at work in clearing the Paishwani river which, I believe, is the river which flows from the Nilambur area, an estimate of Rs. 34,900 having been sanctioned in that year. I have been informed orally by Mr. Tireman that the principal effect of these operations (I presume by increasing the rapidity of the run off of the river) has been to reduce the average level of the water in it so as to render the rafting of timber very much more difficult than before. If that is correct, it would seem that the clearance of these streams is by no means so simple a matter as might have been supposed and probably requires very much more close investigation and more specialised knowledge than the Public Works Department have yet been able to bring to bear upon it. In any case, the investigation by an overseer does not appear to me to be a satisfactory basis upon which to embark upon a matter of this kind. I consider therefore that the Chief Conservator should be told that the operations on these river beds must await the investigation of the Chief Forest Engineer and the development of the scheme for exploiting the Kanara jungles and I think we must call for a report from him as to the effect of the similar operations which have been undertaken in the Paishwani.

H. G. STOKES—11-10-22.

I quite agree.

A. R. K[NAPP]—15-10-22.

A draft order is submitted for approval. It may be sent to the Public Works Department for acceptance.

S.R.R.—17-10-22.

K. NAGESWARA RAO—18-10-22.

H.G.S.—20-10-22.

PUBLIC WORKS (IRRIGATION) DEPARTMENT.

The draft order may be accepted in this department and the file returned to Development.

T.S.R.—24-10-22.

R. NARASIMHA AYYANGAR—24-10-22.

A. H. MORIN—30-10-22.

DEVELOPMENT DEPARTMENT.

The draft order put up may issue.

K.N.R.—2-11-22. H.G.S.—3-11-22.

[G.O. No. 1456, Development, dated 4th November 1922.]

Government of Madras

DEVELOPMENT DEPARTMENT

G.O. No. 1456, 4th November 1922

Forests—South Kanara district—Rivers—Floating facilities—Investigation—Dropped.

READ—the following papers :—

I

Letter from S. Cox, Esq., C.I.E., I.F.S., Chief Conservator of Forests, to the Secretary to Government, Development Department, dated Madras, the 20th August 1921, Ref. No. 298/20-2.

I have the honour to submit herewith for the orders of Government copy of a report, dated 18th July 1921, from the Conservator of Forests, Sixth Circle, proposing an examination of the main rivers in the South Kanara district with a view to improving their floating capabilities.

2. In this connexion reference is solicited to Mr. Tireman's report No. 517, dated 17th February 1920 (copy enclosed) on the scheme for development of the South Kanara forests. One of the proposals made by Mr. Tireman was that steps should be taken to facilitate floating, in the Kumharadari and Paishwani rivers. Government have already sanctioned an estimate for Rs. 4,000 for blasting and clearing obstructions in the Paishwani river—vide G.O. No. 369 I., dated 20th November 1920. Mr. Tireman now requests that orders may be issued for an examination of four other rivers in the ensuing dry weather, so that necessary works may be undertaken in due course to render these rivers also navigable for timber rafts. Should Government see no objection I request that orders may be issued to the Public Works Department to undertake an examination and report the result.

3. Mr. Tireman's report on the development of South Kanara forests referred to above, was informally discussed by the Executive Council in May 1920 and the proposals received general assent; but I refrained from placing them formally before Government until I was able to spare an officer for special duty to prepare a forest project for the whole district, a work which would take several months to complete. Mr. Tireman now hopes that with the help of the Forest Utilization Officer he will be able to prepare a scheme himself during the coming cold weather. Meanwhile, I request that orders may be issued for an examination of the rivers in the manner indicated by the Conservator.

ENCLOSURES

(i).

Letter from the Conservator of Forests, Sixth Circle, Ootacamund, to the Chief Conservator of Forests, dated Ootacamund, the 18th July 1921, No. Ref. M. 344/21-1.

In connexion with my proposals for the development of the South Kanara forests (vide my C. No. 517/20-1, dated 17th February 1920) it will be necessary to examine the main rivers in that district with a view to improving their floating capabilities and I request that Government may be addressed with a view to such an examination being commenced during the ensuing dry weather. The following rivers will require examination :—

(1) The Kumaradhari river from the junction of the Kallaje and Adi-Holes to Uppinangadi about thirty-two miles.

(2) The Gundia river from Gundia to its junction with No. 1 about sixteen miles.

(3) The Netravati river and its affluent the Charmadi river from Charmadi to Uppinangadi about twenty-four miles.

(4) The Shishla river from Shishla to its junction with No. 3 about fifteen miles.

These four rivers are in the Uppinangadi taluk. There are several in the more northern taluks, but before I ask for their examination I should prefer to see something of the country. The examination of the four rivers named will probably be as much as can be done in one season.

(ii)

Letter from the Conservator of Forests, Western Circle, Coimbatore, to the Chief Conservator of Forests, dated Coimbatore, the 17th February 1920, No. 517.

I have the honour to report that I have now seen a fair proportion of the forests in the South Mangalore Division and to put forward the following proposals for their future treatment. The object of my two visits—one to the Paishwani river valley, and the other to the forests in the basin of the Netravati on the Mangalore-Shiradi road—was to ascertain whether there was any prospect of a big scheme of exploitation. This may at once be ruled out of the question as the forests have almost all been subjected to kumri in the not very distant past, and are on the whole of poor quality. Small patches of very fine evergreen forest do exist having evidently escaped kumri, and there are also patches containing deciduous timber of large size which presumably have not been kumried for a long period of years. Mr. W. C. Hart, Extra Assistant Conservator of Forests, who, a few years ago, was engaged in preparing working-plans for the forests of Paishwani and Kumharadari valleys examined these patches both evergreen and deciduous in some detail and estimated their extent at about 17,000 acres. He further estimated that the over-mature stock therein amounted to something like 120,000 tons of timber; making due allowance for over-sanguine estimates, if only these patches formed one or two compact blocks it would be possible to embark on a big scheme of exploitation, but unfortunately they are scattered over something like 250,000 acres and are for the most part of small extent, the largest measuring about 4,000 acres. Concentration, with which alone any exploitation scheme on a large scale would be profitable, is thus out of the question, and a further adverse feature is the fact that the patches are not all situated in the same river basin.

2. There are however endless possibilities for the future. The state here possesses a very large and compact area of forest extending over some 250,000 acres. I have no doubt whatever that the greater part if not the whole of this was once covered with magnificent evergreen forest. My reasons for holding this opinion are, firstly that from a careful study of the factors governing the distribution of evergreen and deciduous forest I am convinced that in this climate with an annual rainfall of upwards of 200 inches the forests are always evergreen unless they have been subjected to fire or are situated on very shallow soil, secondly the existence of the evergreen patches referred to above which carry as fine a stand of timber as I have seen in any forest and which in no way differ as regards the factors of the locality from the surrounding country which we know to have been subject to kumri, thirdly the fact that in most of the valleys which, though almost certainly kumried in the past, retain in such a damp climate a considerable quantity of moisture throughout the hot weather, thus escaping the annual fires which sweep over the drier hill sides, the forest is evergreen with occasional large trees of Vateria indica and Hopea vightiana, and lastly the fact that in the forests which have been protected from fire an evergreen undergrowth is gradually spreading under the deciduous trees. Whether I am right or wrong however I think that there can be no doubt that an evergreen crop in this locality is to be preferred to a deciduous one owing to the greater stand of timber, the better quality of evergreen trees as regards soundness, and the fact that an evergreen crop requires less attention than a deciduous one. In parenthesis it would be as well to say that I have seen no land suitable for growing teak.

3. Despite the absence hitherto of much systematic research into the sylviculture of the evergreen species sufficient is known regarding certain species to make it a matter of practical certainty that they can be successfully cultivated in the forest tract under consideration. I refer to Hopea parviflora, Vateria indica, Artocarpus hirsuta and mango. Hopea has been cultivated for generations by the ryots of Kanara, and it has of recent years been sown in several places under a deciduous crop. I have seen several of these sowings and have found only one failure which was due to the choking of the seedlings by a dense growth of Strobilanthus the result of a severe opening of the canopy, and of subsequent absence of attention. Vateria indica is commonly planted or sown in Kanara as an avenue tree, and I have moreover successfully raised it under deciduous shade in Coorg though only on an experimental scale. Artocarpus hirsuta will grow anywhere on the west coast. I have raised it in Coorg in a fairly large scale in the open and on a small scale under shade, and I saw in Kanara some very promising sowings. Mango is one of the easiest trees to grow from seed. A forest composed of these species will be extremely valuable; two of them yield timber of the very first quality which moreover is highly prized in the local markets, while the other two yield excellent box-making timber.

4. There being therefore little doubt as to the possibility of replacing the existing poor stock—consisting chiefly of badly grown Xylia, Terminalia tomentosa and Terminalia paniculata—by the species enumerated above, or of the subsequent value of a crop consisting thereof, I recommend that steps be taken to stock as large an area as possible with them. I cannot specify at present the area which can be dealt with annually, but in order to lose no time I have already given orders that 1,000 acres are to be sown this year and in a short time it should be possible to draw up a definite scheme of working. Sowing is a cheap method, and I see no reason—given sufficient establishment—why we should not eventually restock one-hundredth part of the area (i.e., about 2,500 acres) every year. An inspection of any evergreen forest will show that the species selected come to no harm if the seedlings are left to themselves, and there is thus

no reason why sowing should not proceed in advance of the tending which of course will subsequently be required to establish the young crop. In any case if this view proves to be wrong not much harm will have been done. Later on when we know more about them we can introduce other evergreen species. I would not sow the evergreen crop in places where there is a really good young crop already on the ground of the valuable deciduous species. Such young crops chiefly Xylia occur occasionally in patches.

5. It will be necessary when this is possible to increase the establishment to an extent which will permit of tending the whole of the crop to be sown, i.e., possibly 2,500 acres per annum and of extracting the timber which will be felled in the course of the tending. From experience of similar work in Coorg where, though the old crop is much more valuable, the young crop consisting of teak, rosewood, and Pterocarpus is much more costly to raise, I think it will be found that the timber which will be extracted in the interests of the young crop will more than cover the cost of establishing the latter even leaving out of account the patches containing fine timber. Including these latter the net result should show a fair profit, and the new crop should thus be established at no cost. To extract the timber at a profit however it is imperative to improve the rivers so as to facilitate floating which at present both in the Kumharadari and Paishwani rivers is very difficult and costly. Mr. Peddie of the Public Works Department has recently prepared an estimate for improving the Paishwani and I recommend that the work should be sanctioned and put in hand during the next dry weather. I also recommend that Government be asked at once to depute an officer to examine the Kumharadari river this dry weather and to submit an estimate for its improvement.

6. When the Paishwani has been improved and it should be possible to do this before the floating season of 1921 a large quantity of timber can be extracted from the over-mature patches in this valley commencing with the Jalsur East reserved forest where fellings as prescribed in Mr. Hart's working-plan are now in progress, although, owing to the difficulty in floating, the possibility laid down by him cannot be worked up to. He prescribed merely selection fellings. I propose to fell much more heavily and in fact to carry out fellings under the uniform method on the lines of those which you saw in Coorg. Mr. Hart estimates the possibility under his method at about 11,000 tons from about 400 acres. Under the uniform method it should be a good deal more but making allowances for unduly sanguine estimates and retaining Mr. Hart's figure there is ample work to keep the establishment employed for a couple of years or more.

7. In addition to the river training works it will be necessary largely to increase the dragging facilities in the Jalsur East and the other larger areas of good timber. I propose that the American Consulting Forest Engineer should be taken to the Paishwâni valley and asked for his opinion, but the country is fairly easy and in the meantime I am in favour of constructing a considerable length of drag paths in the Jalsur East reserved forest in order that large quantities of timber can be dragged down to the Kandaka stream, a tributary of the Paishwani, which skirts the reserve, in time to be floated in the monsoon of 1921. Ranger Swamikutti could, I think, easily carry out the work of aligning these paths, and there is no reason why considerable progress should not be made next monsoon. With a good system of drag paths I foresee no difficulty in dragging by means of elephants and buffaloes or possibly a tractor a much larger quantity of timber than has yet been attempted.

8. I have alluded more than once to the question of establishment. My ideas on the subject are possibly on the large side, but I feel that here we have a property of very great potential value and if the Forest department is to justify its existence it is high time we set about to put that property into the best possible condition and to make two or more trees grow where only one grew before. The existing establishment is based on the works at present in progress. These are chiefly works of exploitation and have been inaugurated from time to time in various localities in a somewhat haphazard manner; no review of the needs of the forests as a whole has ever been undertaken as far as I am aware, nor have proposals on any serious scale ever been made to develop the valuable property aforesaid. I have not yet seen the forests of North Mangalore, but I gather that with the exception of the fuel, catechu and sandalwood reserves of the Coondapoor and Udipi ranges the greater part is in much the same condition as the forests of the South Division and that the area of such forest is about 150,000 acres. We thus have 400,000 acres to deal with, or on a provisional rotation of 100 years 4,000 acres per annum to stock with a young crop and to clear of the existing one. I do not think that one Ranger can deal efficiently with the sowing, tending and fire-protection of more than 500 acres per annum, and as I very roughly estimate that the old crop will yield on the average 12 tons per acre (which means 6,000 tons off 500 acres) I think that another ranger will be required for the exploitation of this quantity of timber. Thus 16 rangers will in the not very distant future be required for the 400,000 acres of timber forest with possibly two more for fuel, catechu, and sandalwood or 18 in all, as compared with the present establishment of 7. It will also be necessary to form another division, two District Forest Officers each probably dealing with an annual regeneration area of 1,600 acres and the third with one of 800 acres in addition to the fuel, catechu and sandal work. As things are at present it is useless going into the question of the territorial arrangement of the divisions and ranges, nor do I propose to deal with the lower subordinate establishment which will be required. If my proposals are generally accepted the District Forest Officer can work out details.

9. The South Division is very badly off in the matter of buildings; if the work which I am now advocating is to be properly done it will be necessary for forest officers in future to

stay in one place for several days at a time; in the case of the local fund sheds they can never be sure of not being turned out, and these sheds are for the most part miserable affairs and usually located in the most malarious places—presumably in order to obtain water easily. Considerable expenditure therefore will be necessary in order to provide comfortable and healthy quarters for the District Forest Officer, Rangers, Foresters and Guards. Communications also are very inadequate. The good roads all run east and west across the forests and although there is a road running more or less through the forests northwards from Jalsur to near Beltangadi in three sections with a total length of about 50 miles, it is impassable for a motor-car for most of the year, and even for carts for a considerable part of the year. It is essential that we should have a road passable for a car except during heavy floods and I advocate improving this road accordingly. It will also be necessary to construct a number of subsidiary fair weather roads. This would probably cost in all about Rs. 2 lakhs while another sum of about Rs. 1 lakh will be required for buildings. In the North Division which I have not yet seen possibly Rs. 2 lakhs would be required for similar work, while propably Rs. 2 lakhs would be required in both divisions together for river improvement work. The total outlay would thus be in the neighbourhood of Rs. 7 lakhs. This does not make provision for dragpaths and carting roads for extracting timber to the rivers; the country is as a rule fairly easy and these should not cost very much; their cost will moreover be covered almost immediately by the sale-proceeds of the timber extracted. The Rs. 7 lakhs referred to represent a capital investment. My figures are of course very rough; details have to be worked out by the District Forest Officers.

10. Seven lakhs is perhaps a somewhat alarming figure compared with what the department is accustomed to spend, but the district has been starved in the past. The total expenditure in the whole district (North and South Divisions) during the last twenty years has been on roads and bridges Rs. 27,763; on buildings Rs. 58,435; on sowing and planting Rs. 5,154; and on other works of improvement (A. VIII. g) Rs. 17,631; and annual average on works of improving the forest (exclusive of protection from fire) of Rs. 5,449. With expenditure on these lines we are not going to make much progress.

11. On the modest estimate of 12 tons to the acre referred to in paragraph 8 the annual yield obtained by working 4,000 acres per annum would be 48,000 tons. A very low estimate of the net profit obtainable on this is Rs. 10 per ton which means an annual profit of nearly Rs. 5 lakhs; this after paying for the necessary sylvicultural work and establishment (perhaps Rs. 2 lakhs) would in the course of a very few years repay all the capital invested. It must also be remembered that the existing crop is growing larger every year and that the annual yield will thus gradually increase.

12. In the immediate future I propose as outlined in paragraphs 4 to 7 to sow 1,000 acres per annum in the South Division, to render floating in the Kumaradari and Paishwani rivers easy, and to extract as much timber as possible from the Jalsur East reserve. For this at least one additional ranger is required, and the District Forest Officer is now preparing proposals to split the existing unwieldy Uppinangadi range which covers 154,000 acres. I am also giving orders to have 1,000 acres sown this year in the North Division. I also propose to close down the various scattered works such as improvement fellings, climber cuttings and the like which are now proceeding in what I have called a somewhat haphazard manner, and to concentrate all the energies of the division of the new work. Fire protection of the sown area will be a sine qua non and I am calling on the District Forest Officer to submit proposals. As regards the North Division I hope to tour there next year and to work out some definite details as to what is required.

13. If you agree with my views I request that you will put my letter before Government. I think that it should know what a potentiality fine property it possesses in its South Kanara forests and be requested to state whether it is prepared to make the outlay necessary to put that property into order. In any case the outlay is not likely to be more than about Rs. 2 per acre, and this will probably very soon be recouped. My scheme is not—as I had hoped—one which is going to bring in a large return at an early date, but the owner of a forest property must look a long way ahead; in this case the return though long deferred should be a very fine one.

II

Official Memorandum No. 1589/21-I.B.-1, Public Works, dated 7th September 1921.

A copy of the letter from the Chief Conservator of Forests, Reference No. 298–20–2, dated 20th August 1921, together with its enclosure is herewith forwarded to the Superintending Engineer, IV Circle, who is requested to arrange for an early examination of the four rivers referred to therein with a view to improving their floating capabilities and submit a report on the subject.

(By order)

R. Narasimha Ayyangar,
der Secretary to Government.

To the Superintending Engineer, IV Circle.

III

Letter from P. Hawkins, Esq., M. Inst. C.E., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated Coimbatore, the 11th August 1922. No. 239-I.

With reference to your Memorandum No. 1589/21–I.B.-1, dated 7th September 1921, I have the honour to forward herewith the marginally-noted five estimates aggregating to Rs. 5,88,500 together with a preliminary report submitted by the Subdivisional Officer and a tracing. On the basis of the standard of clearance adopted the Kumaradhari and Gundia rivers can be cleared fairly easily while the others would be expensive.

	Rs.
(1) Blasting rock and clearing obstructions in the Kallaja hole	5,000
(2) Blasting rock and clearing obstructions in the Kumaradhari hole	1,90,000
(3) Blasting rock and clearing obstructions in the Gundia hole	33,000
(4) Blasting rock and clearing obstructions in the Netravati river	3,55,000
(5) Blasting rock and clearing obstructions in the Shisla hole	5,500

The amount of clearance which the Forest department would require is, however, not quite certain. Much would depend upon the season of the year at which their rafting operations would be undertaken. I have instructed the Executive Engineer to consult the Forest department on this point with a view to fix the level down to which a channel should be cleared, and am also consulting the Conservator of Forests, Sixth Circle.

I am sending you separately a report of progress on the Paishwani river which has been satisfactory.

Enclosures

(1)

Letter from the Assistant Engineer, South Kanara subdivision, dated the 10th July 1922. No. 738-E.

Report on floating capabilities of certain rivers in Uppinangadi taluk.

I submit herewith the report received from Overseer M.R.Ry. S. Nanjunda Ayyar on the investigation of the four rivers specified in the letter from the Conservator of Forests, Sixth Circle. I regret I had no opportunity to examine the rivers which I wished to do after the receipt of his report, but having to attend to the Paishwani river work he could not submit it earlier. It is now too late to examine the rivers owing to freshes.

2. To enable the floating of timber the rivers have to be improved at a prohibitive cost—approximate estimates are attached :—

(1) (*a*) Kallaja hole for a length of 9 miles above its junction with the Kumaradhari—Rs. 5,000.

This was included in the investigation as decided by the Chief Conservator of Forests during the conference held in December last.

(*b*) The Kumaradhari from the infall of Kallaja hole down to Uppinangadi—about 32 miles—Rs. 1,90,000.

(2) The Gundia from Gundia down to its junction with the Kumaradhari—length about 16 miles—Rs. 33,000.

(3) The Netravati and its affluent Charmadi hole from Charmadi down to Panemangalore—Rs. 3,55,000.

The portion between Uppinangadi and Panemangalore which will cost about Rs. 20,000 was included as decided at the conference. This will be necessary in case the Kumaradhari alone is to be improved.

(4) The Shisla from Shisla to Parasurama devasthanam—a distance of about 8 miles—Rs. 5,500.

Below Parasurama devasthanam it will not be possible to float timber since at Parapikallu obstruction the river has a sudden fall of 20 feet, and below the river runs in deep and rocky gorges with zig-zag course and sudden drops with right angle bend at every fall for a length of about 3½ miles. Even if it be possible to improve the river the cost will be too prohibitive. Therefore the portion below Parasurama devasthanam has been omitted. Timber may be floated down from Shisla to the above point whence it may be carted to 37 miles on Shiradi road. From there it can be sent down the Netravati.

(5) The obstructions in items 1 (*a*), 2 and 4 are in no way formidable.

Item 1 (*b*)—*Kumaradhari.*—At Yakkadka, below the junction of Gundia and at Viramangila there are drops in the river of 5′ to 6′; the river course is very zig-zag, the bed very rocky. Also commencing from Narimogaru down to the junction with the Netravati the river has rocky bed with projecting boulders with winding and zig-zag course, deep and rapid gorges and drops.

Item 3—*Netravati.*—At Arbi obstruction about a mile below the Dharmasthala road crossing the river has a sudden fall of 15′ to 20′ and runs in deep rocky gorges with zig-zag course for a length of about 2 miles. There are similar difficult obstructions (1) about half a mile above Dharmasthala road crossing, (2) below the junction of Beltangadi hole (3) beyond Uppinangadi to the west, viz., Shripadi obstruction, (4) at Bantwal. But the worst of these is the one at Arbi.

(6) Considering the prohibitive cost of improvement of these rivers, Netravati in particular, the improvement of this river from Charmadi down to 37 miles on Shiradi road may be altogether dropped.

The cost of improvement to the Netravati below 37 miles on Shiradi road will be about Rs. 28,000.

(7) The estimates allow for clearing a channel 20′ wide to enable timber being floated. The rate allowed is the same as that for Paishwani river work.

(8) The six atlas sheets received with No. 949-S.K., dated 21st December 1921, are herewith returned.

(2)

General report to accompany the estimates for blasting rock and clearing obstructions in the rivers in Uppinangadi taluk.

[Amount of all estimates Rs. 5,88,500.]

These have been prepared as per reference from the Chief Conservator of Forests in his No. 298/20–2, dated 20th August 1921, requesting to inspect all the rivers in Uppinangadi taluk regarding their floating capabilities bearing Public Works Department Memorandum No. 1589/21–I.B.–1, dated 7th September 1921.

All the rivers as per the reference of the Conservator of Forests have been investigated by me with the help of Forest Guards guiding me along the margin, and estimates have been prepared for all the rivers except one, i.e., Shisla hole for which an estimate has been prepared till Parasurama Devasthanam and beyond Parasurama Devasthanam it is not possible to float since at Parapikallu where the river falls vertically by 20 feet and from there the river goes in deep gorges with steep rocky margin and with right-angular turnings at every fall. Below this Parapi for a length of 3½ miles the river goes in rocky gorges with many bed falls and zig-zag turnings. So the portion from Parasurama Devasthanam up to the junction with Netravati has been left out and the timber can easily be carted on road from Parasurama Devasthanam up to 37th mile on Siradi road and then floated in the Netravati.

Kallaje hole.—There are not much obstructions in the river except at few places and that too not difficult ones.

Kumaradhari.—The difficult portions are at (1) Yekkada, (2) below the junction with Gundia, (3) Viramangila, (4) Narimogaru commencement up to junction with Netravati.

Gundia hole.—There are only very few difficult obstructions in this river.

Netravati river.—The difficult portions are (1) half a mile above Dharmastala road crossing, (2) one mile below Dharmastala road crossing known as Arbi obstruction, (3) below the junction with Beltangadi hole, (4) Shripadi obstruction, (5) Bantwal obstruction.

Of all the above obstructions, Arbi obstruction is one of the difficult ones where the water falls vertically from 15 feet height and below for a length of two miles the river goes in rocky beds with zig-zag turnings and also with bed falls here and there.

Shisla hole.—There are not much rock from Shisla down to Parasurama devasthanam but there are lot of temporary dams built across the river for irrigation purposes.

The estimate provides for blasting rock and removing the same and also for erecting sheds for work people and storing materials tools and plants, etc. The rate allowed for in the estimate is as for Paishwani works in progress.

(3)

Endorsement by the Executive Engineer, West Coast division, No. 828-S.E., dated 20th July 1922.

Forwarded to Superintending Engineer, IV Circle, with maps showing the different names of the rivers dealt with. I have not been able to make any inspection of the rivers personally and inspection before the end of the monsoon would be useless. But from the Subdivisional Officer's report which is very clear, it seems that the Kumaradari river and the Gundia can be improved at a reasonable cost. While with regard to the others the cost seems prohibitive. Inspection will be possible probably about November or December next and I will then submit a further report if you think it necessary.

DEVELOPMENT DEPARTMENT.

NOTES CONNECTED WITH G.O. No. 1456, DEVELOPMENT, DATED 4TH NOVEMBER 1922.

[SUBJECT.—*South Kanara forests—Examination of the rivers for forest exploitation.*]

From the Chief Conservator of Forests, Ref. No. 298-20-2, *dated the* 20*th August* 1921.

Please see the Chief Conservator's letter. Submitted that the Public Works Department (Irrigation) may be requested to issue orders for examining the four rivers mentioned in Mr. Tireman's letter dated 18th July 1921 with a view to improving their floating capabilities.

R.V.—30-8-21.

K. NAGESWARA RAO—2-9-21.

J. M. TURING—2-9-21.

PUBLIC WORKS (IRRIGATION) DEPARTMENT.

Please see the letter from the Chief Conservator of Forests and the Development Department note above. A copy of the letter with its enclosures may be sent to the Superintending Engineer, IV Circle, for report of the floating capabilities of the four rivers mentioned therein. A draft endorsement to the Superintending Engineer is accordingly submitted for approval and orders for issue. The Superintending Engineer will be reminded after two months.

T.S.R.—6-9-21.

R. NARASIMHA AYYANGAR—7-9-21.

A. H. MORIN—2-9-21.

[Memorandum No. 1589/21 I.B., dated 7th September 1921.]

From the Superintending Engineer, IV Circle, No. 239 *I., dated* 11*th August* 1922.

Submitted for orders if the estimates submitted by the Superintending Engineer may be examined in Technical section. No preliminary report has been received with the estimates These estimates were called for with reference to paragraphs 2 and 3 of the letter from the Chief Conservator of Forests. If it is not considered necessary to check the estimates, the file may be sent to the Development Department for remarks as to further action to be taken

T.S.R.—15-8-22.

The preliminary report which is missing may be called for.

R.N.—13-8-22. A.H.M.—15-8-22.

A draft memorandum to the Superintending Engineer, IV Circle, calling for the missing preliminary report for the work is submitted for approval.

2. A report of the progress of work on the Paishwani river promised by the Superintending Engineer in his letter No. 239 I., dated 11th August 1922, has now been received and is put up in the linked file.

G.V.—22-8-22.

R.N.—22-8-22.

The file may be sent to Development for remarks. The cost seems to be prohibitive.

R.N.—5-9-22. A.H.M.—5-9-22

DEVELOPMENT DEPARTMENT.

Last year the Chief Conservator requested that the Public Works Department may be asked to make an examination of certain rivers in the South Kanara district with a view to improving their floating capabilities. This formed part of a scheme which the Chief Conservator had on hand for the development of South Kanara forests. The rivers have been examined by the Public Works Department who reported that the estimated cost of improving them is Rs. 5,88,500.

2. The Chief Conservator has since submitted his report on the development of South Kanara forests and he has been informed that the scheme is too ambitious and that it should lie over until the exploitation branch is in a position to tackle it. Perhaps the proposal in this file may also lie over for the present.

The file may be sent to the Chief Conservator for perusal with the concurrence of the Public Works Department.

S.R.R —11-9-22. K. NAGESWARA RAO—12-9-22.

H. G. STOKES—13-9-22.

OFFICE OF THE CHIEF CONSERVATOR OF FORESTS.

The cost of the larger schemes is so great that there is no use proceeding further with them until the new Engineering branch has had an opportunity of examining the whole project for exploiting the Kanara forests.

2. Meanwhile the comparatively cheap scheme for the improvement of the Netravati below 37/0 miles on the Shiradi road should be proceeded with. This will cost about Rs. 28,000. A fair quantity of timber is extracted from 37/0 miles on the Shiradi road. At present there is no very great difficulty in floating this timber with the help of bamboos, but the bamboos are fast dying and in another year or two there will be none left. If extraction of timber is to go on it will be necessary to float it with the help of boats, the logs being lashed alongside on both sides. This cannot be done unless the existing passages through the rocks are widened. If the work of improving the reach in question is done a much larger quantity of timber can be extracted than is dealt with now, and the cost (Rs. 28,000) will soon be recouped.

H. TIREMAN—3-10-22.

DEVELOPMENT DEPARTMENT.

The Chief Conservator's proposal may be supported and the file passed on to Public Works Department. It is believed that the necessary funds will be provided for in that department's budget.

K.N.R.—10-10-22.

The proposals in this file relate to a suggestion made in 1921 by the Chief Conservator of Forests that certain rivers in the Uppinangadi taluk in South Kanara should be investigated with a view to clearing the obstructions in their course, in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation of the rivers has been made under the orders of the Public Works Department but I observe that no officer higher than an overseer has made the investigation or has inspected the rivers. The total cost is put down at Rs. 5,88,500. It is distributed as follows:—

	RS.
(1) On the Kumaradhari river two schemes—one at Rs. 5,000 and the other at Rs. 1,90,000	1,95,000
(2) On the Gudia river	33,000
(3) The Netravati	3,55,000
(4) The Shishla river	5,500
Total ...	5,88,500

The Chief Conservator of Forests recommends in his note of 3rd October 1922 that only one portion, namely, on the Netravati from a point on the Shiradi road at the 37th mile downwards should be undertaken at a cost of Rs. 28,000.

2. In my opinion no money should be spent upon these works at all, until the whole question of the exploiting of these forests on a commercial scale has been gone into by the special staff under the Chief Forest Engineer and staff whom we expect in 1923-24. C-4 will remember that we have declined to include in the budget for 1923-24 an ambitious scheme of expenditure for the exploitation of these forests which Mr. Tireman proposed to include in the budget and until the prospects of that scheme are adequately investigated by the expert lumbering staff, I consider that money should not be spent upon interference with these rivers. It is, of course, out of question for financial reasons to embark upon an expenditure so extravagant as Rs. 5,88,500 which is now indicated. A further reason which renders it desirable in my opinion that we should not interfere with these rivers until we have had the benefit of the examination of the question by the special lumbering engineers, is that there is some reason to doubt whether in schemes of this kind it is sufficient simply to clear away the obstructions and provide a clear run through for the rafts which have to descend the stream. Since 1920 the Public Works Department has been at work in clearing the Paishwani river which, I believe, is the river which flows from the Nilambur area, an estimate of Rs. 34,900 having been sanctioned in that year. I have been informed orally by Mr. Tireman that the principal effect of these operations (I presume by increasing the rapidity of the run off of the river) has been to reduce the average level of the water in it so as to render the rafting of timber very much more difficult than before. If that is correct, it would seem that the clearance of these streams is by no means so simple a matter as might have been supposed and probably requires very much more close investigation and more specialised knowledge than the Public Works Department have yet been able to bring to bear upon it. In any case, the investigation by an overseer does not appear to me to be a satisfactory basis upon which to embark upon a matter of this kind. I consider therefore that the Chief Conservator should be told that the operations on these river beds must await the investigation of the Chief Forest Engineer and the development of the scheme for exploiting the Kanara jungles and I think we must call for a report from him as to the effect of the similar operations which have been undertaken in the Paishwani.

H. G. STOKES—11-10-22.

I quite agree.

A. R. K[NAPP]—15-10-22.

A draft order is submitted for approval. It may be sent to the Public Works Department for acceptance.

S.R.R.—17-10-22.

K. NAGESWARA RAO—18-10-22.

H.G.S.—20-10-22.

PUBLIC WORKS (IRRIGATION) DEPARTMENT.

The draft order may be accepted in this department and the file returned to Development.

T.S.R.—24-10-22.

R. NARASIMHA AYYANGAR—24-10-22.

A. H. MORIN—30-10-22.

DEVELOPMENT DEPARTMENT.

The draft order put up may issue.

K.N.R.—2-11-22. H.G.S.—3-11-22.

[G.O. No. 1456, Development, dated 4th November 1922.]

Government of Madras

DEVELOPMENT DEPARTMENT

G.O. No. 1456, 4th November 1922

Forests—South Kanara district—Rivers—Floating facilities—Investigation—Dropped.

READ—the following papers:—

1

Letter from S. Cox, Esq., C.I.E., I.F.S., Chief Conservator of Forests, to the Secretary to Government, Development Department, dated Madras, the 20th August 1921, Ref. No. 298/20-2.

I have the honour to submit herewith for the orders of Government copy of a report, dated 18th July 1921, from the Conservator of Forests, Sixth Circle, proposing an examination of the main rivers in the South Kanara district with a view to improving their floating capabilities.

2. In this connexion reference is solicited to Mr. Tireman's report No. 517, dated 17th February 1920 (copy enclosed) on the scheme for development of the South Kanara forests. One of the proposals made by Mr. Tireman was that steps should be taken to facilitate floating, in the Kumharadari and Paishwani rivers. Government have already sanctioned an estimate for Rs. 4,000 for blasting and clearing obstructions in the Paishwani river—vide G.O. No. 369 I., dated 20th November 1920. Mr. Tireman now requests that orders may be issued for an examination of four other rivers in the ensuing dry weather, so that necessary works may be undertaken in due course to render these rivers also navigable for timber rafts. Should Government see no objection I request that orders may be issued to the Public Works Department to undertake an examination and report the result.

3. Mr. Tireman's report on the development of South Kanara forests referred to above, was informally discussed by the Executive Council in May 1920 and the proposals received general assent; but I refrained from placing them formally before Government until I was able to spare an officer for special duty to prepare a forest project for the whole district, a work which would take several months to complete. Mr. Tireman now hopes that with the help of the Forest Utilization Officer he will be able to prepare a scheme himself during the coming cold weather. Meanwhile, I request that orders may be issued for an examination of the rivers in the manner indicated by the Conservator.

ENCLOSURES

(i)

Letter from the Conservator of Forests, Sixth Circle, Ootacamund, to the Chief Conservator of Forests, dated Ootacamund, the 18th July 1921, No. Ref. M. 344/21-1.

In connexion with my proposals for the development of the South Kanara forests (vide my C. No. 517/20-1, dated 17th February 1920) it will be necessary to examine the main rivers in that district with a view to improving their floating capabilities and I request that Government may be addressed with a view to such an examination being commenced during the ensuing dry weather. The following rivers will require examination:—

(1) The Kumaradhari river from the junction of the Kallaie and Adi-Holes to Uppinangadi about thirty-two miles.

(2) The Gundia river from Gundia to its junction with No. 1 about sixteen miles.

(3) The Netravati river and its affluent the Charmadi river from Charmadi to Uppinangadi about twenty-four miles.

(4) The Shishla river from Shishla to its junction with No. 3 about fifteen miles.

These four rivers are in the Uppinangadi taluk. There are several in the more northern taluks, but before I ask for their examination I should prefer to see something of the country. The examination of the four rivers named will probably be as much as can be done in one season.

(ii)

Letter from the Conservator of Forests, Western Circle, Coimbatore, to the Chief Conservator of Forests, dated Coimbatore, the 17th February 1920, No. 517.

I have the honour to report that I have now seen a fair proportion of the forests in the South Mangalore Division and to put forward the following proposals for their future treatment. The object of my two visits—one to the Paishwani river valley, and the other to the forests in the basin of the Netravati on the Mangalore-Shiradi road—was to ascertain whether there was any prospect of a big scheme of exploitation. This may at once be ruled out of the question as the forests have almost all been subjected to kumri in the not very distant past, and are on the whole of poor quality. Small patches of very fine evergreen forest do exist having evidently escaped kumri, and there are also patches containing deciduous timber of large size which presumably have not been kumried for a long period of years. Mr. W. C. Hart, Extra Assistant Conservator of Forests, who, a few years ago, was engaged in preparing working-plans for the forests of Paishwani and Kumbaradari valleys examined these patches both evergreen and deciduous in some detail and estimated their extent at about 17,000 acres. He further estimated that the over-mature stock therein amounted to something like 120,000 tons of timber; making due allowance for over-sanguine estimates, if only these patches formed one or two compact blocks it would be possible to embark on a big scheme of exploitation, but unfortunately they are scattered over something like 250,000 acres and are for the most part of small extent, the largest measuring about 4,000 acres. Concentration, with which alone any exploitation scheme on a large scale would be profitable, is thus out of the question, and a further adverse feature is the fact that the patches are not all situated in the same river basin.

2. There are however endless possibilities for the future. The state here possesses a very large and compact area of forest extending over some 250,000 acres. I have no doubt whatever that the greater part if not the whole of this was once covered with magnificent evergreen forest. My reasons for holding this opinion are, firstly that from a careful study of the factors governing the distribution of evergreen and deciduous forest I am convinced that in this climate with an annual rainfall of upwards of 200 inches the forests are always evergreen unless they have been subjected to fire or are situated on very shallow soil, secondly the existence of the evergreen patches referred to above which carry as fine a stand of timber as I have seen in any forest and which in no way differ as regards the factors of the locality from the surrounding country which we know to have been subject to kumri, thirdly the fact that in most of the valleys which, though almost certainly kumried in the past, retain in such a damp climate a considerable quantity of moisture throughout the hot weather, thus escaping the annual fires which sweep over the drier hill sides, the forest is evergreen with occasional large trees of Vateria indica and Hopea vightiana, and lastly the fact that in the forests which have been protected from fire an evergreen undergrowth is gradually spreading under the deciduous trees. Whether I am right or wrong however I think that there can be no doubt that an evergreen crop in this locality is to be preferred to a deciduous one owing to the greater stand of timber, the better quality of evergreen trees as regards soundness, and the fact that an evergreen crop requires less attention than a deciduous one. In parenthesis it would be as well to say that I have seen no land suitable for growing teak.

3. Despite the absence hitherto of much systematic research into the sylviculture of the evergreen species sufficient is known regarding certain species to make it a matter of practical certainty that they can be successfully cultivated in the forest tract under consideration. I refer to Hopea parviflora, Vateria indica, Artocarpus hirsuta and mango. Hopea has been cultivated for generations by the ryots of Kanara, and it has of recent years been sown in several places under a deciduous crop. I have seen several of these sowings and have found only one failure which was due to the choking of the seedlings by a dense growth of Strobilanthus the result of a severe opening of the canopy, and of subsequent absence of attention. Vateria indica is commonly planted or sown in Kanara as an avenue tree, and I have moreover successfully raised it under deciduous shade in Coorg though only on an experimental scale. Artocarpus hirsuta will grow anywhere on the west coast. I have raised it in Coorg in a fairly large scale in the open and on a small scale under shade, and I saw in Kanara some very promising sowings. Mango is one of the easiest trees to grow from seed. A forest composed of these species will be extremely valuable; two of them yield timber of the very first quality which moreover is highly prized in the local markets, while the other two yield excellent box-making timber.

4. There being therefore little doubt as to the possibility of replacing the existing poor stock—consisting chiefly of badly grown Xylia, Terminalia tomentosa and Terminalia paniculata—by the species enumerated above, or of the subsequent value of a crop consisting thereof, I recommend that steps be taken to stock as large an area as possible with them. I cannot specify at present the area which can be dealt with annually, but in order to lose no time I have already given orders that 1,000 acres are to be sown this year and in a short time it should be possible to draw up a definite scheme of working. Sowing is a cheap method, and I see no reason—given sufficient establishment—why we should not eventually restock one-hundredth part of the area (i.e., about 2,500 acres) every year. An inspection of any evergreen forest will show that the species selected come to no harm if the seedlings are left to themselves, and there is thus

no reason why sowing should not proceed in advance of the tending which of course will subsequently be required to establish the young crop. In any case if this view proves to be wrong not much harm will have been done. Later on when we know more about them we can introduce other evergreen species. I would not sow the evergreen crop in places where there is a really good young crop already on the ground of the valuable deciduous species. Such young crops chiefly Xylia occur occasionally in patches.

5. It will be necessary when this is possible to increase the establishment to an extent which will permit of tending the whole of the crop to be sown, i.e., possibly 2,500 acres per annum and of extracting the timber which will be felled in the course of the tending. From experience of similar work in Coorg where, though the old crop is much more valuable, the young crop consisting of teak, rosewood, and Pterocarpus is much more costly to raise, I think it will be found that the timber which will be extracted in the interests of the young crop will more than cover the cost of establishing the latter even leaving out of account the patches containing fine timber. Including these latter the net result should show a fair profit, and the new crop should thus be established at no cost. To extract the timber at a profit however it is imperative to improve the rivers so as to facilitate floating which at present both in the Kumharadari and Paishwani rivers is very difficult and costly. Mr. Peddie of the Public Works Department has recently prepared an estimate for improving the Paishwani and I recommend that the work should be sanctioned and put in hand during the next dry weather. I also recommend that Government be asked at once to depute an officer to examine the Kumharadari river this dry weather and to submit an estimate for its improvement.

6. When the Paishwani has been improved and it should be possible to do this before the floating season of 1921 a large quantity of timber can be extracted from the over-mature patches in this valley commencing with the Jalsur East reserved forest where fellings as prescribed in Mr. Hart's working-plan are now in progress, although, owing to the difficulty in floating, the possibility laid down by him cannot be worked up to. He prescribed merely selection fellings. I propose to fell much more heavily and in fact to carry out fellings under the uniform method on the lines of those which you saw in Coorg. Mr. Hart estimates the possibility under his method at about 11,000 tons from about 400 acres. Under the uniform method it should be a good deal more but making allowances for unduly sanguine estimates and retaining Mr. Hart's figure there is ample work to keep the establishment employed for a couple of years or more.

7. In addition to the river training works it will be necessary largely to increase the dragging facilities in the Jalsur East and the other larger areas of good timber. I propose that the American Consulting Forest Engineer should be taken to the Paishwani valley and asked for his opinion, but the country is fairly easy and in the meantime I am in favour of constructing a considerable length of drag paths in the Jalsur East reserved forest in order that large quantities of timber can be dragged down to the Kandaka stream, a tributary of the Paishwani, which skirts the reserve, in time to be floated in the monsoon of 1921. Ranger Swamikutti could, I think, easily carry out the work of aligning these paths, and there is no reason why considerable progress should not be made next monsoon. With a good system of drag paths I foresee no difficulty in dragging by means of elephants and buffaloes or possibly a tractor a much larger quantity of timber than has yet been attempted.

8. I have alluded more than once to the question of establishment. My ideas on the subject are possibly on the large side, but I feel that here we have a property of very great potential value and if the Forest department is to justify its existence it is high time we set about to put that property into the best possible condition and to make two or more trees grow where only one grew before. The existing establishment is based on the works at present in progress. These are chiefly works of exploitation and have been inaugurated from time to time in various localities in a somewhat haphazard manner; no review of the needs of the forests as a whole has ever been undertaken as far as I am aware, nor have proposals on any serious scale ever been made to develop the valuable property aforesaid. I have not yet seen the forests of North Mangalore, but I gather that with the exception of the fuel, catechu and sandalwood reserves of the Coondapoor and Udipi ranges the greater part is in much the same condition as the forests of the South Division and that the area of such forest is about 150,000 acres. We thus have 400,000 acres to deal with, or on a provisional rotation of 100 years 4,000 acres per annum to stock with a young crop and to clear of the existing one. I do not think that one Ranger can deal efficiently with the sowing, tending and fire-protection of more than 500 acres per annum, and as I very roughly estimate that the old crop will yield on the average 12 tons per acre (which means 6,000 tons off 500 acres) I think that another ranger will be required for the exploitation of this quantity of timber. Thus 16 rangers will in the not very distant future be required for the 400,000 acres of timber forest with possibly two more for fuel, catechu, and sandalwood or 18 in all, as compared with the present establishment of 7. It will also be necessary to form another division, two District Forest Officers each probably dealing with an annual regeneration area of 1,600 acres and the third with one of 800 acres in addition to the fuel, catechu and sandal work. As things are at present it is useless going into the question of the territorial arrangement of the divisions and ranges, nor do I propose to deal with the lower subordinate establishment which will be required. If my proposals are generally accepted the District Forest Officer can work out details.

9. The South Division is very badly off in the matter of buildings; if the work which I am now advocating is to be properly done it will be necessary for forest officers in future to

stay in one place for several days at a time; in the case of the local fund sheds they can never be sure of not being turned out, and these sheds are for the most part miserable affairs and usually located in the most malarious places—presumably in order to obtain water easily. Considerable expenditure therefore will be necessary in order to provide comfortable and healthy quarters for the District Forest Officer, Rangers, Foresters and Guards. Communications also are very inadequate. The good roads all run east and west across the forests and although there is a road running more or less through the forests northwards from Jalsur to near Beltangadi in three sections with a total length of about 50 miles, it is impassable for a motor-car for most of the year, and even for carts for a considerable part of the year. It is essential that we should have a road passable for a car except during heavy floods and I advocate improving this road accordingly. It will also be necessary to construct a number of subsidiary fair weather roads. This would probably cost in all about Rs. 2 lakhs while another sum of about Rs. 1 lakh will be required for buildings. In the North Division which I have not yet seen possibly Rs. 2 lakhs would be required for similar work, while propably Rs. 2 lakhs would be required in both divisions together for river improvement work. The total outlay would thus be in the neighbourhood of Rs. 7 lakhs. This does not make provision for dragpaths and carting roads for extracting timber to the rivers; the country is as a rule fairly easy and these should not cost very much; their cost will moreover be covered almost immediately by the sale-proceeds of the timber extracted. The Rs. 7 lakhs referred to represent a capital investment. My figures are of course very rough; details have to be worked out by the District Forest Officers.

10. Seven lakhs is perhaps a somewhat alarming figure compared with what the department is accustomed to spend, but the district has been starved in the past. The total expenditure in the whole district (North and South Divisions) during the last twenty years has been on roads and bridges Rs. 27,763; on buildings Rs. 58,435; on sowing and planting Rs. 5,154; and on other works of improvement (A. VIII. g) Rs. 17,631; and annual average on works of improving the forest (exclusive of protection from fire) of Rs. 5,449. With expenditure on these lines we are not going to make much progress.

11. On the modest estimate of 12 tons to the acre referred to in paragraph 8 the annual yield obtained by working 4,000 acres per annum would be 48,000 tons. A very low estimate of the net profit obtainable on this is Rs. 10 per ton which means an annual profit of nearly Rs. 5 lakhs; this after paying for the necessary sylvicultural work and establishment (perhaps Rs. 2 lakhs) would in the course of a very few years repay all the capital invested. It must also be remembered that the existing crop is growing larger every year and that the annual yield will thus gradually increase.

12. In the immediate future I propose as outlined in paragraphs 4 to 7 to sow 1,000 acres per annum in the South Division, to render floating in the Kumaradari and Paishwani rivers easy, and to extract as much timber as possible from the Jalsur East reserve. For this at least one additional ranger is required, and the District Forest Officer is now preparing proposals to split the existing unwieldy Uppinangadi range which covers 154,000 acres. I am also giving orders to have 1,000 acres sown this year in the North Division. I also propose to close down the various scattered works such as improvement fellings, climber cuttings and the like which are now proceeding in what I have called a somewhat haphazard manner, and to concentrate all the energies of the division of the new work. Fire protection of the sown area will be a sine qua non and I am calling on the District Forest Officer to submit proposals. As regards the North Division I hope to tour there next year and to work out some definite details as to what is required.

13. If you agree with my views I request that you will put my letter before Government. I think that it should know what a potentiality fine property it possesses in its South Kanara forests and be requested to state whether it is prepared to make the outlay necessary to put that property into order. In any case the outlay is not likely to be more than about Rs. 2 per acre, and this will probably very soon be recouped. My scheme is not—as I had hoped—one which is going to bring in a large return at an early date, but the owner of a forest property must look a long way ahead; in this case the return though long deferred should be a very fine one.

II

Official Memorandum No. 1589/21-I.B.-1, Public Works, dated 7th September 1921.

A copy of the letter from the Chief Conservator of Forests, Reference No. 298–20–2, dated 20th August 1921, together with its enclosure is herewith forwarded to the Superintending Engineer, IV Circle, who is requested to arrange for an early examination of the four rivers referred to therein with a view to improving their floating capabilities and submit a report on the subject.

(By order)

R. Narasimha Ayyangar,
Under Secretary to Government.

To the Superintending Engineer, IV Circle.

III

Letter from P. Hawkins, Esq., M. Inst. c.e., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated Coimbatore, the 11th August 1922, No. 239-I.

With reference to your Memorandum No. 1589/21–I.B.-I, dated 7th September 1921, I have the honour to forward herewith the marginally-noted five estimates aggregating to Rs. 5,88,500 together with a preliminary report submitted by the Subdivisional Officer and a tracing. On the basis of the standard of clearance adopted the Kumaradhari and Gundia rivers can be cleared fairly easily while the others would be expensive.

	Rs.
(1) Blasting rock and clearing obstructions in the Kallaja hole	5,000
(2) Blasting rock and clearing obstructions in the Kumaradhari hole	1,90,000
(3) Blasting rock and clearing obstructions in the Gundia hole	33,000
(4) Blasting rock and clearing obstructions in the Netravati river	3,55,000
(5) Blasting rock and clearing obstructions in the Shisla hole	5,500

The amount of clearance which the Forest department would require is, however, not quite certain. Much would depend upon the season of the year at which their rafting operations would be undertaken. I have instructed the Executive Engineer to consult the Forest department on this point with a view to fix the level down to which a channel should be cleared, and am also consulting the Conservator of Forests, Sixth Circle.

I am sending you separately a report of progress on the Paishwani river, which has been satisfactory.

Enclosures

(1)

Letter from the Assistant Engineer, South Kanara subdivision, dated the 10th July 1922. No. 738-E.

Report on floating capabilities of certain rivers in Uppinangadi taluk.

I submit herewith the report received from Overseer M.R.Ry. S. Nanjunda Ayyar on the investigation of the four rivers specified in the letter from the Conservator of Forests, Sixth Circle. I regret I had no opportunity to examine the rivers which I wished to do after the receipt of his report, but having to attend to the Paishwani river work he could not submit it earlier. It is now too late to examine the rivers owing to freshes.

2. To enable the floating of timber the rivers have to be improved at a prohibitive cost—approximate estimates are attached :—

(1) (*a*) Kallaja hole for a length of 9 miles above its junction with the Kumaradhari—Rs. 5,000.

This was included in the investigation as decided by the Chief Conservator of Forests during the conference held in December last.

(*b*) The Kumaradhari from the infall of Kallaja hole down to Uppinangadi—about 32 miles—Rs. 1,90,000.

(2) The Gundia from Gundia down to its junction with the Kumaradhari—length about 16 miles—Rs. 33,000.

(3) The Netravati and its affluent Charmadi hole from Charmadi down to Panemangalore—Rs. 3,55,000.

The portion between Uppinangadi and Panemangalore which will cost about Rs. 20,000 was included as decided at the conference. This will be necessary in case the Kumaradhari alone is to be improved.

(4) The Shisla from Shisla to Parasurama devasthanam—a distance of about 8 miles—Rs. 5,500.

Below Parasurama devasthanam it will not be possible to float timber since at Parapikallu obstruction the river has a sudden fall of 20 feet, and below the river runs in deep and rocky gorges with zig-zag course and sudden drops with right angle bend at every fall for a length of about 3½ miles. Even if it be possible to improve the river the cost will be too prohibitive. Therefore the portion below Parasurama devasthanam has been omitted. Timber may be floated down from Shisla to the above point whence it may be carted to 37 miles on Shiradi road. From there it can be sent down the Netravati.

(5) The obstructions in items 1 (*a*), 2 and 4 are in no way formidable.

Item 1 (*b*)—*Kumaradhari.*—At Yakkadka, below the junction of Gundia and at Viramangila there are drops in the river of 5′ to 6′; the river course is very zig-zag, the bed very rocky. Also commencing from Narimogaru down to the junction with the Netravati the river has rocky bed with projecting boulders with winding and zig-zag course, deep and rapid gorges and drops.

Item 3—*Netravati.*—At Arbi obstruction about a mile below the Dharmasthala road crossing the river has a sudden fall of 15′ to 20′ and runs in deep rocky gorges with zig-zag course for a length of about 2 miles. There are similar difficult obstructions (1) about half a mile above Dharmasthala road crossing, (2) below the junction of Beltangadi hole (3) beyond Uppinangadi to the west, viz., Shripadi obstruction, (4) at Bantwal. But the worst of these is the one at Arbi.

(6) Considering the prohibitive cost of improvement of these rivers, Netravati in particular, the improvement of this river from Charmadi down to 37 miles on Shiradi road may be altogether dropped.

The cost of improvement to the Netravati below 37 miles on Shiradi road will be about Rs. 28,000.

(7) The estimates allow for clearing a channel 20′ wide to enable timber being floated The rate allowed is the same as that for Paishwani river work.

(8) The six atlas sheets received with No. 949-S.K., dated 21st December 1921, are herewith returned.

(2)

General report to accompany the estimates for blasting rock and clearing obstructions in the rivers in Uppinangadi taluk.

[Amount of all estimates Rs. 5,88,500.]

These have been prepared as per reference from the Chief Conservator of. Forests in his No. 298/20–2, dated 20th August 1921, requesting to inspect all the rivers in Uppinangadi taluk regarding their floating capabilities bearing Public Works Department Memorandum No. 1589/21–I.B.–1, dated 7th September 1921.

All the rivers as per the reference of the Conservator of Forests have been investigated by me with the help of Forest Guards guiding me along the margin, and estimates have been prepared for all the rivers except one, i.e., Shisla hole for which an estimate has been prepared till Parasurama Devasthanam and beyond Parasurama Devasthanam it is not possible to float since at Parapikallu where the river falls vertically by 20 feet and from there the river goes in deep gorges with steep rocky margin and with right-angular turnings at every fall. Below this Parapi for a length of 3½ miles the river goes in rocky gorges with many bed falls and zig-zag turnings. So the portion from Parasurama Devasthanam up to the junction with Netravati has been left out and the timber can easily be carted on road from Parasurama Devasthanam up to 37th mile on Siradi road and then floated in the Netravati.

Kallaje hole.—There are not much obstructions in the river except at few places and that too not difficult ones.

Kumaradhari.—The difficult portions are at (1) Yekkada, (2) below the junction with Gundia, (3) Viramangila, (4) Narimogaru commencement up to junction with Netravati.

Gundia hole.—There are only very few difficult obstructions in this river.

Netravati river.—The difficult portions are (1) half a mile above Dharmastala road crossing, (2) one mile below Dharmastala road crossing known as Arbi obstruction, (3) below the junction with Beltangadi hole, (4) Shripadi obstruction, (5) Bantwal obstruction.

Of all the above obstructions, Arbi obstruction is one of the difficult ones where the water falls vertically from 15 feet height and below for a length of two miles the river goes in rocky beds with zig-zag turnings and also with bed falls here and there.

Shisla hole.—There are not much rock from Shisla down to Parasurama devasthanam but there are lot of temporary dams built across the river for irrigation purposes.

The estimate provides for blasting rock and removing the same and also for erecting sheds for work people and storing materials tools and plants, etc. The rate allowed for in the estimate is as for Paishwani works in progress.

(3)

Endorsement by the Executive Engineer, West Coast division, No. 828-S.E., dated 20th July 1922.

Forwarded to Superintending Engineer, IV Circle, with maps showing the different names of the rivers dealt with. I have not been able to make any inspection of the rivers personally and inspection before the end of the monsoon would be useless. But from the Subdivisional Officer's report which is very clear, it seems that the Kumaradari river and the Gundia can be improved at a reasonable cost. While with regard to the others the cost seems prohibitive. Inspection will be possible probably about November or December next and I will then submit a further report if you think it necessary.

Order—No. 1456, Development, dated 4th November 1922.

In August 1921 the Chief Conservator of Forests submitted proposals that certain rivers in the Uppinangadi taluk in the South Kanara district should be investigated with a view to clearing the obstructions in their course in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation has been made by the Public Works Department and the total cost has been estimated to be Rs. 5,88,500. The Government consider that the operations on these river beds must await the investigation by the Chief Forest Engineer of the whole scheme for the development of the South Kanara forests.

2. The Chief Conservator of Forests is requested to submit a report as to the effect of similar operations undertaken in the Paishwani river with reference to G.O. No. 369 I., dated 20th November 1920.

(By order of the Governor in Council)

H. G. Stokes,
Acting Secretary to Government.

To the Chief Conservator of Forests.
,, Public Works Department (with estimates and one plan).
,, Publicity Officer.

DEVELOPMENT DEPARTMENT.

NOTES CONNECTED WITH G.O. No. 1456, DEVELOPMENT, DATED 4TH NOVEMBER 1922.

[SUBJECT.—*South Kanara forests—Examination of the rivers for forest exploitation.*

From the Chief Conservator of Forests, Ref. No. 298-20-2, *dated the* 20*th August* 1921.

Please see the Chief Conservator's letter. Submitted that the Public Works Department (Irrigation) may be requested to issue orders for examining the four rivers mentioned in Mr. Tireman's letter dated 18th July 1921 with a view to improving their floating capabilities.

R.V.—30-8-21. K. NAGESWARA RAO—2-9-21.
J. M. TURING—2-9-21.

PUBLIC WORKS (IRRIGATION) DEPARTMENT.

Please see the letter from the Chief Conservator of Forests and the Development Department note above. A copy of the letter with its enclosures may be sent to the Superintending Engineer, IV Circle, for report of the floating capabilities of the four rivers mentioned therein. A draft endorsement to the Superintending Engineer is accordingly submitted for approval and orders for issue. The Superintending Engineer will be reminded after two months.

T.S.R.—6-9-21. R. NARASIMHA AYYANGAR—7-9-21.
A. H. MORIN—2-9-21.

[Memorandum No. 1589/21 I.B., dated 7th September 1921.]

From the Superintending Engineer, IV Circle, No. 239 *I., dated* 11*th August* 1922.

Submitted for orders if the estimates submitted by the Superintending Engineer may be examined in Technical section. No preliminary report has been received with the estimates These estimates were called for with reference to paragraphs 2 and 3 of the letter from the Chief Conservator of Forests. If it is not considered necessary to check the estimates, the file may be sent to the Development Department for remarks as to further action to be taken.

T.S.R.—15-8-22.

The preliminary report which is missing may be called for.

R.N.—13-8-22. A.H.M.—15-8-22.

A draft memorandum to the Superintending Engineer, IV Circle, calling for the missing preliminary report for the work is submitted for approval.

2. A report of the progress of work on the Paishwani river promised by the Superintending Engineer in his letter No. 239 I., dated 11th August 1922, has now been received and is put up in the linked file.

G.V.—22-8-22. R.N.—22-8-22.

The file may be sent to Development for remarks. The cost seems to be prohibitive.

R.N.—5-9-22. A.H.M.—5-9-22

DEVELOPMENT DEPARTMENT.

Last year the Chief Conservator requested that the Public Works Department may be asked to make an examination of certain rivers in the South Kanara district with a view to improving their floating capabilities. This formed part of a scheme which the Chief Conservator had on hand for the development of South Kanara forests. The rivers have been examined by the Public Works Department who reported that the estimated cost of improving them is Rs. 5,88,500.

2. The Chief Conservator has since submitted his report on the development of South Kanara forests and he has been informed that the scheme is too ambitious and that it should lie over until the exploitation branch is in a position to tackle it. Perhaps the proposal in this file may also lie over for the present.

The file may be sent to the Chief Conservator for perusal with the concurrence of the Public Works Department.

S.R.R —11-9-22.

K. NAGESWARA RAO—12-9-22.

H. G. STOKES—13-9-22.

OFFICE OF THE CHIEF CONSERVATOR OF FORESTS.

The cost of the larger schemes is so great that there is no use proceeding further with them until the new Engineering branch has had an opportunity of examining the whole project for exploiting the Kanara forests.

2. Meanwhile the comparatively cheap scheme for the improvement of the Netravati below 37/0 miles on the Shiradi road should be proceeded with. This will cost about Rs. 28,000. A fair quantity of timber is extracted from 37/0 miles on the Shiradi road. At present there is no very great difficulty in floating this timber with the help of bamboos, but the bamboos are fast dying and in another year or two there will be none left. If extraction of timber is to go on it will be necessary to float it with the help of boats, the logs being lashed alongside on both sides. This cannot be done unless the existing passages through the rocks are widened. If the work of improving the reach in question is done a much larger quantity of timber can be extracted than is dealt with now, and the cost (Rs. 28,000) will soon be recouped.

H. TIRRMAN—3-10-22.

DEVELOPMENT DEPARTMENT.

The Chief Conservator's proposal may be supported and the file passed on to Public Works Department. It is believed that the necessary funds will be provided for in that department's budget.

K.N.R.—10-10-22.

The proposals in this file relate to a suggestion made in 1921 by the Chief Conservator of Forests that certain rivers in the Uppinangadi taluk in South Kanara should be investigated with a view to clearing the obstructions in their course, in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation of the rivers has been made under the orders of the Public Works Department but I observe that no officer higher than an overseer has made the investigation or has inspected the rivers. The total cost is put down at Rs. 5,88,500. It is distributed as follows:—

	Rs.
(1) On the Kumaradhari river two schemes—one at Rs. 5,000 and the other at Rs. 1,90,000	1,95,000
(2) On the Gudia river	33,000
(3) The Netravati	3,55,000
(4) The Shishla river	5,500
Total ...	5,88,500

The Chief Conservator of Forests recommends in his note of 3rd October 1922 that only one portion, namely, on the Netravati from a point on the Shiradi road at the 37th mile downwards should be undertaken at a cost of Rs. 28,000.

2. In my opinion no money should be spent upon these works at all, until the whole question of the exploiting of these forests on a commercial scale has been gone into by the special staff under the Chief Forest Engineer and staff whom we expect in 1923–24. C-4 will remember that we have declined to include in the budget for 1923–24 an ambitious scheme of expenditure for the exploitation of these forests which Mr. Tireman proposed to include in the budget and until the prospects of that scheme are adequately investigated by the expert lumbering staff, I consider that money should not be spent upon interference with these rivers. It is, of course, out of question for financial reasons to embark upon an expenditure so extravagant as Rs. 5,88,500 which is now indicated. A further reason which renders it desirable in my opinion that we should not interfere with these rivers until we have had the benefit of the examination of the question by the special lumbering engineers, is that there is some reason to doubt whether in schemes of this kind it is sufficient simply to clear away the obstructions and provide a clear run through for the rafts which have to descend the stream. Since 1920 the Public Works Department has been at work in clearing the Paishwani river which, I believe, is the river which flows from the Nilambur area, an estimate of Rs. 34,900 having been sanctioned in that year. I have been informed orally by Mr. Tireman that the principal effect of these operations (I presume by increasing the rapidity of the run off of the river) has been to reduce the average level of the water in it so as to render the rafting of timber very much more difficult than before. If that is correct, it would seem that the clearance of these streams is by no means so simple a matter as might have been supposed and probably requires very much more close investigation and more specialised knowledge than the Public Works Department have yet been able to bring to bear upon it. In any case, the investigation by an overseer does not appear to me to be a satisfactory basis upon which to embark upon a matter of this kind. I consider therefore that the Chief Conservator should be told that the operations on these river beds must await the investigation of the Chief Forest Engineer and the development of the scheme for exploiting the Kanara jungles and I think we must call for a report from him as to the effect of the similar operations which have been undertaken in the Paishwani.

H. G. STOKES—11-10-22.

I quite agree.

A. R. K[NAPP]—15-10-22.

A draft order is submitted for approval. It may be sent to the Public Works Department for acceptance.

S.R.R.—17-10-22. K. NAGESWARA RAO—18-10-22.

H.G.S.—20-10-22.

PUBLIC WORKS (IRRIGATION) DEPARTMENT.

The draft order may be accepted in this department and the file returned to Development.

T.S.R.—24-10-22. R. NARASIMHA AYYANGAR—24-10-22.

A. H. MORIN—30-10-22.

DEVELOPMENT DEPARTMENT.

The draft order put up may issue.

K.N.R.—2-11-22. H.G.S.—3-11-22.

[G.O. No. 1456, Development, dated 4th November 1922.]

Government of Madras

DEVELOPMENT DEPARTMENT

G.O No. 1456, 4th November 1922

Forests—South Kanara district—Rivers—Floating facilities—Investigation—Dropped.

READ—the following papers :—

I

Letter from S. Cox, Esq., C.I.E., I.F.S., Chief Conservator of Forests, to the Secretary to Government, Development Department, dated Madras, the 20th August 1921, Ref. No. 298/20-2.

I have the honour to submit herewith for the orders of Government copy of a report, dated 18th July 1921, from the Conservator of Forests, Sixth Circle, proposing an examination of the main rivers in the South Kanara district with a view to improving their floating capabilities.

2. In this connexion reference is solicited to Mr. Tireman's report No. 517, dated 17th February 1920 (copy enclosed) on the scheme for development of the South Kanara forests. One of the proposals made by Mr. Tireman was that steps should be taken to facilitate floating, in the Kumharadari and Paishwani rivers. Government have already sanctioned an estimate for Rs. 4,000 for blasting and clearing obstructions in the Paishwani river—vide G.O. No. 369 I., dated 20th November 1920. Mr. Tireman now requests that orders may be issued for an examination of four other rivers in the ensuing dry weather, so that necessary works may be undertaken in due course to render these rivers also navigable for timber rafts. Should Government see no objection I request that orders may be issued to the Public Works Department to undertake an examination and report the result.

3. Mr. Tireman's report on the development of South Kanara forests referred to above, was informally discussed by the Executive Council in May 1920 and the proposals received general assent; but I refrained from placing them formally before Government until I was able to spare an officer for special duty to prepare a forest project for the whole district, a work which would take several months to complete. Mr. Tireman now hopes that with the help of the Forest Utilization Officer he will be able to prepare a scheme himself during the coming cold weather. Meanwhile, I request that orders may be issued for an examination of the rivers in the manner indicated by the Conservator.

ENCLOSURES

(i)

Letter from the Conservator of Forests, Sixth Circle, Ootacamund, to the Chief Conservator of Forests, dated Ootacamund, the 18th July 1921, No. Ref. M. 344/21-1.

In connexion with my proposals for the development of the South Kanara forests (vide my C. No. 517/20-1, dated 17th February 1920) it will be necessary to examine the main rivers in that district with a view to improving their floating capabilities and I request that Government may be addressed with a view to such an examination being commenced during the ensuing dry weather. The following rivers will require examination :—

(1) The Kumaradhari river from the junction of the Kallaje and Adi-Holes to Uppinangadi about thirty-two miles.

(2) The Gundia river from Gundia to its junction with No. 1 about sixteen miles.

(3) The Netravati river and its affluent the Charmadi river from Charmadi to Uppinangadi about twenty-four miles.

(4) The Shishla river from Shishla to its junction with No. 3 about fifteen miles.

These four rivers are in the Uppinangadi taluk. There are several in the more northern taluks, but before I ask for their examination I should prefer to see something of the country. The examination of the four rivers named will probably be as much as can be done in one season.

(ii)

Letter from the Conservator of Forests, Western Circle, Coimbatore, to the Chief Conservator of Forests, dated Coimbatore, the 17th February 1920, No. 517.

I have the honour to report that I have now seen a fair proportion of the forests in the South Mangalore Division and to put forward the following proposals for their future treatment. The object of my two visits—one to the Paishwani river valley, and the other to the forests in the basin of the Netravati on the Mangalore-Shiradi road—was to ascertain whether there was any prospect of a big scheme of exploitation. This may at once be ruled out of the question as the forests have almost all been subjected to kumri in the not very distant past, and are on the whole of poor quality. Small patches of very fine evergreen forest do exist having evidently escaped kumri, and there are also patches containing deciduous timber of large size which presumably have not been kumried for a long period of years. Mr. W. C. Hart, Extra Assistant Conservator of Forests, who, a few years ago, was engaged in preparing working-plans for the forests of Paishwani and Kumharadafi valleys examined these patches both evergreen and deciduous in some detail and estimated their extent at about 17,000 acres. He further estimated that the over-mature stock therein amounted to something like 120,000 tons of timber; making due allowance for over-sanguine estimates, if only these patches formed one or two compact blocks it would be possible to embark on a big scheme of exploitation, but unfortunately they are scattered over something like 250,000 acres and are for the most part of small extent, the largest measuring about 4,000 acres. Concentration, with which alone any exploitation scheme on a large scale would be profitable, is thus out of the question, and a further adverse feature is the fact that the patches are not all situated in the same river basin.

2. There are however endless possibilities for the future. The state here possesses a very large and compact area of forest extending over some 250,000 acres. I have no doubt whatever that the greater part if not the whole of this was once covered with magnificent evergreen forest. My reasons for holding this opinion are, firstly that from a careful study of the factors governing the distribution of evergreen and deciduous forest I am convinced that in this climate with an annual rainfall of upwards of 200 inches the forests are always evergreen unless they have been subjected to fire or are situated on very shallow soil, secondly the existence of the evergreen patches referred to above which carry as fine a stand of timber as I have seen in any forest and which in no way differ as regards the factors of the locality from the surrounding country which we know to have been subject to kumri, thirdly the fact that in most of the valleys which, though almost certainly kumried in the past, retain in such a damp climate a considerable quantity of moisture throughout the hot weather, thus escaping the annual fires which sweep over the drier hill sides, the forest is evergreen with occasional large trees of Vateria indica and Hopea vightiana, and lastly the fact that in the forests which have been protected from fire an evergreen undergrowth is gradually spreading under the deciduous trees. Whether I am right or wrong however I think that there can be no doubt that an evergreen crop in this locality is to be preferred to a deciduous one owing to the greater stand of timber, the better quality of evergreen trees as regards soundness, and the fact that an evergreen crop requires less attention than a deciduous one. In parenthesis it would be as well to say that I have seen no land suitable for growing teak.

3. Despite the absence hitherto of much systematic research into the sylviculture of the evergreen species sufficient is known regarding certain species to make it a matter of practical certainty that they can be successfully cultivated in the forest tract under consideration. I refer to Hopea parviflora, Vateria indica, Artocarpus hirsuta and mango. Hopea has been cultivated for generations by the ryots of Kanara, and it has of recent years been sown in several places under a deciduous crop. I have seen several of these sowings and have found only one failure which was due to the choking of the seedlings by a dense growth of Strobilanthus the result of a severe opening of the canopy, and of subsequent absence of attention. Vateria indica is commonly planted or sown in Kanara as an avenue tree, and I have moreover successfully raised it under deciduous shade in Coorg though only on an experimental scale. Artocarpus hirsuta will grow anywhere on the west coast. I have raised it in Coorg in a fairly large scale in the open and on a small scale under shade, and I saw in Kanara some very promising sowings. Mango is one of the easiest trees to grow from seed. A forest composed of these species will be extremely valuable; two of them yield timber of the very first quality which moreover is highly prized in the local markets, while the other two yield excellent box-making timber.

4. There being therefore little doubt as to the possibility of replacing the existing poor stock—consisting chiefly of badly grown Xylia, Terminalia tomentosa and Terminalia paniculata—by the species enumerated above, or of the subsequent value of a crop consisting thereof, I recommend that steps be taken to stock as large an area as possible with them. I cannot specify at present the area which can be dealt with annually, but in order to lose no time I have already given orders that 1,000 acres are to be sown this year and in a short time it should be possible to draw up a definite scheme of working. Sowing is a cheap method, and I see no reason—given sufficient establishment—why we should not eventually restock one-hundredth part of the area (i.e., about 2,500 acres) every year. An inspection of any evergreen forest will show that the species selected come to no harm if the seedlings are left to themselves, and there is thus

no reason why sowing should not proceed in advance of the tending which of course will subsequently be required to establish the young crop. In any case if this view proves to be wrong not much harm will have been done. Later on when we know more about them we can introduce other evergreen species. I would not sow the evergreen crop in places where there is a really good young crop already on the ground of the valuable deciduous species. Such young crops chiefly Xylia occur occasionally in patches.

5. It will be necessary when this is possible to increase the establishment to an extent which will permit of tending the whole of the crop to be sown, i.e., possibly 2,500 acres per annum and of extracting the timber which will be felled in the course of the tending. From experience of similar work in Coorg where, though the old crop is much more valuable, the young crop consisting of teak, rosewood, and Pterocarpus is much more costly to raise, I think it will be found that the timber which will be extracted in the interests of the young crop will more than cover the cost of establishing the latter even leaving out of account the patches containing fine timber. Including these latter the net result should show a fair profit, and the new crop should thus be established at no cost. To extract the timber at a profit however it is imperative to improve the rivers so as to facilitate floating which at present both in the Kumharadari and Paishwani rivers is very difficult and costly. Mr. Reddie of the Public Works Department has recently prepared an estimate for improving the Paishwani and I recommend that the work should be sanctioned and put in hand during the next dry weather. I also recommend that Government be asked at once to depute an officer to examine the Kumharadari river this dry weather and to submit an estimate for its improvement.

6. When the Paishwani has been improved and it should be possible to do this before the floating season of 1921 a large quantity of timber can be extracted from the over-mature patches in this valley commencing with the Jalsur East reserved forest where fellings as prescribed in Mr. Hart's working-plan are now in progress, although, owing to the difficulty in floating, the possibility laid down by him cannot be worked up to. He prescribed merely selection fellings. I propose to fell much more heavily and in fact to carry out fellings under the uniform method on the lines of those which you saw in Coorg. Mr. Hart estimates the possibility under his method at about 11,000 tons from about 400 acres. Under the uniform method it should be a good deal more but making allowances for unduly sanguine estimates and retaining Mr. Hart's figure there is ample work to keep the establishment employed for a couple of years or more.

7. In addition to the river training works it will be necessary largely to increase the dragging facilities in the Jalsur East and the other larger areas of good timber. I propose that the American Consulting Forest Engineer should be taken to the Paishwani valley and asked for his opinion, but the country is fairly easy and in the meantime I am in favour of constructing a considerable length of drag paths in the Jalsur East reserved forest in order that large quantities of timber can be dragged down to the Kandaka stream, a tributary of the Paishwani, which skirts the reserve, in time to be floated in the monsoon of 1921. Ranger Swamikutti could, I think, easily carry out the work of aligning these paths, and there is no reason why considerable progress should not be made next monsoon. With a good system of drag paths I foresee no difficulty in dragging by means of elephants and buffaloes or possibly a tractor a much larger quantity of timber than has yet been attempted.

8. I have alluded more than once to the question of establishment. My ideas on the subject are possibly on the large side, but I feel that here we have a property of very great potential value and if the Forest department is to justify its existence it is high time we set about to put that property into the best possible condition and to make two or more trees grow where only one grew before. The existing establishment is based on the works at present in progress. These are chiefly works of exploitation and have been inaugurated from time to time in various localities in a somewhat haphazard manner; no review of the needs of the forests as a whole has ever been undertaken as far as I am aware, nor have proposals on any serious scale ever been made to develop the valuable property aforesaid. I have not yet seen the forests of North Mangalore, but I gather that with the exception of the fuel, catechu and sandalwood reserves of the Coondapoor and Udipi ranges the greater part is in much the same condition as the forests of the South Division and that the area of such forest is about 150,000 acres. We thus have 400,000 acres to deal with, or on a provisional rotation of 100 years 4,000 acres per annum to stock with a young crop and to clear of the existing one. I do not think that one Ranger can deal efficiently with the sowing, tending and fire-protection of more than 500 acres per annum, and as I very roughly estimate that the old crop will yield on the average 12 tons per acre (which means 6,000 tons off 500 acres) I think that another ranger will be required for the exploitation of this quantity of timber. Thus 16 rangers will in the not very distant future be required for the 400,000 acres of timber forest with possibly two more for fuel, catechu, and sandalwood or 18 in all, as compared with the present establishment of 7. It will also be necessary to form another division, two District Forest Officers each probably dealing with an annual regeneration area of 1,600 acres and the third with one of 800 acres in addition to the fuel, catechu and sandal work. As things are at present it is useless going into the question of the territorial arrangement of the divisions and ranges, nor do I propose to deal with the lower subordinate establishment which will be required. If my proposals are generally accepted the District Forest Officer can work out details.

The South Division is very badly off in the matter of buildings; if the work which I am now advocating is to be properly done it will be necessary for forest officers in future to

stay in one place for several days at a time; in the case of the local fund sheds they can never be sure of not being turned out, and these sheds are for the most part miserable affairs and usually located in the most malarious places—presumably in order to obtain water easily. Considerable expenditure therefore will be necessary in order to provide comfortable and healthy quarters for the District Forest Officer, Rangers, Foresters and Guards. Communications also are very inadequate. The good roads all run east and west across the forests and although there is a road running more or less through the forests northwards from Jalsur to near Beltangadi in three sections with a total length of about 50 miles, it is impassable for a motor-car for most of the year, and even for carts for a considerable part of the year. It is essential that we should have a road passable for a car except during heavy floods and I advocate improving this road accordingly. It will also be necessary to construct a number of subsidiary fair weather roads. This would probably cost in all about Rs. 2 lakhs while another sum of about Rs. 1 lakh will be required for buildings. In the North Division which I have not yet seen possibly Rs. 2 lakhs would be required for similar work, while propably Rs. 2 lakhs would be required in both divisions together for river improvement work. The total outlay would thus be in the neighbourhood of Rs. 7 lakhs. This does not make provision for dragpaths and carting roads for extracting timber to the rivers; the country is as a rule fairly easy and these should not cost very much; their cost will moreover be covered almost immediately by the sale-proceeds of the timber extracted. The Rs. 7 lakhs referred to represent a capital investment. My figures are of course very rough; details have to be worked out by the District Forest Officers.

10. Seven lakhs is perhaps a somewhat alarming figure compared with what the department is accustomed to spend, but the district has been starved in the past. The total expenditure in the whole district (North and South Divisions) during the last twenty years has been on roads and bridges Rs. 27,763; on buildings Rs. 58,435; on sowing and planting Rs. 5,154; and on other works of improvement (A. VIII. g) Rs. 17,631; and annual average on works of improving the forest (exclusive of protection from fire) of Rs. 5,449. With expenditure on these lines we are not going to make much progress.

11. On the modest estimate of 12 tons to the acre referred to in paragraph 8 the annual yield obtained by working 4,000 acres per annum would be 48,000 tons. A very low estimate of the net profit obtainable on this is Rs. 10 per ton which means an annual profit of nearly Rs. 5 lakhs; this after paying for the necessary sylvicultural work and establishment (perhaps Rs. 2 lakhs) would in the course of a very few years repay all the capital invested. It must also be remembered that the existing crop is growing larger every year and that the annual yield will thus gradually increase.

12. In the immediate future I propose as outlined in paragraphs 4 to 7 to sow 1,000 acres per annum in the South Division, to render floating in the Kumaradari and Paishwani rivers easy, and to extract as much timber as possible from the Jalsur East reserve. For this at least one additional ranger is required, and the District Forest Officer is now preparing proposals to split the existing unwieldy Uppinangadi range which covers 154,000 acres. I am also giving orders to have 1,000 acres sown this year in the North Division. I also propose to close down the various scattered works such as improvement fellings, climber cuttings and the like which are now proceeding in what I have called a somewhat haphazard manner, and to concentrate all the energies of the division of the new work. Fire protection of the sown area will be a sine qua non and I am calling on the District Forest Officer to submit proposals. As regards the North Division I hope to tour there next year and to work out some definite details as to what is required.

13. If you agree with my views I request that you will put my letter before Government. I think that it should know what a potentiality fine property it possesses in its South Kanara forests and be requested to state whether it is prepared to make the outlay necessary to put that property into order. In any case the outlay is not likely to be more than about Rs. 2 per acre, and this will probably very soon be recouped. My scheme is not—as I had hoped—one which is going to bring in a large return at an early date, but the owner of a forest property must look a long way ahead; in this case the return though long deferred should be a very fine one.

II

Official Memorandum No. 1589/21-I.B.-1, Public Works, dated 7th September 1921.

A copy of the letter from the Chief Conservator of Forests, Reference No. 298-20-2, dated 20th August 1921, together with its enclosure is herewith forwarded to the Superintending Engineer, IV Circle, who is requested to arrange for an early examination of the four rivers referred to therein with a view to improving their floating capabilities and submit a report on the subject.

(By order)

R. Narasimha Ayyangar,
Under Secretary to Government.

To the Superintending Engineer, IV Circle.

III

Letter from P. HAWKINS, Esq., M. INST. C.E., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated Coimbatore, the 11th August 1922, No: 239-I.

With reference to your Memorandum No. 1589/21-I.B.-1, dated 7th September 1921, I have the honour to forward herewith the marginally-noted five estimates aggregating to Rs. 5,88,500 together with a preliminary report submitted by the Subdivisional Officer and a tracing. On the basis of the standard of clearance adopted the Kumaradhari and Gundia rivers can be cleared fairly easily while the others would be expensive.

	RS.
(1) Blasting rock and clearing obstructions in the Kallaja hole	5,000
(2) Blasting rock and clearing obstructions in the Kumaradhari hole	1,90,000
(3) Blasting rock and clearing obstructions in the Gundia hole	33,000
(4) Blasting rock and clearing obstructions in the Netravati river	3,55,000
(5) Blasting rock and clearing obstructions in the Shisla hole	5,500

The amount of clearance which the Forest department would require is, however, not quite certain. Much would depend upon the season of the year at which their rafting operations would be undertaken. I have instructed the Executive Engineer to consult the Forest department on this point with a view to fix the level down to which a channel should be cleared, and am also consulting the Conservator of Forests, Sixth Circle.

I am sending you separately a report of progress on the Paishwani river, which has been satisfactory.

ENCLOSURE:

(1)

Letter from the Assistant Engineer, South Kanara subdivision, dated the 10th July 1922, No. 738-E.

Report on floating capabilities of certain rivers in Uppinangadi taluk.

I submit herewith the report received from Overseer M.R.Ry. S. Nanjunda Ayyar on the investigation of the four rivers specified in the letter from the Conservator of Forests, Sixth Circle. I regret I had no opportunity to examine the rivers which I wished to do after the receipt of his report, but having to attend to the Paishwani river work he could not submit it earlier. It is now too late to examine the rivers owing to freshes.

2. To enable the floating of timber the rivers have to be improved at a prohibitive cost—approximate estimates are attached :—

(1) (*a*) Kallaja hole for a length of 9 miles above its junction with the Kumaradhari—Rs. 5,000.

This was included in the investigation as decided by the Chief Conservator of Forests during the conference held in December last.

(*b*) The Kumaradhari from the infall of Kallaja hole down to Uppinangadi—about 32 miles—Rs. 1,90,000.

(2) The Gundia from Gundia down to its junction with the Kumaradhari—length about 16 miles—Rs. 33,000.

(3) The Netravati and its affluent Charmadi hole from Charmadi down to Panemangalore—Rs. 3,55,000.

The portion between Uppinangadi and Panemangalore which will cost about Rs. 20,000 was included as decided at the conference. This will be necessary in case the Kumaradhari alone is to be improved.

(4) The Shisla from Shisla to Parasurama devasthanam—a distance of about 8 miles—Rs. 5,500.

Below Parasurama devasthanam it will not be possible to float timber since at Parapikallu obstruction the river has a sudden fall of 20 feet, and below the river runs in deep and rocky gorges with zig-zag course and sudden drops with right angle bend at every fall for a length of about 3½ miles. Even if it be possible to improve the river the cost will be too prohibitive. Therefore the portion below Parasurama devasthanam has been omitted. Timber may be floated down from Shisla to the above point whence it may be carted to 37 miles on Shiradi road. From there it can be sent down the Netravati.

(5) The obstructions in items 1 (*a*), 2 and 4 are in no way formidable.

Item 1 (*b*)—*Kumaradhari.*—At Yakkadka, below the junction of Gundia and at Viramangila there are drops in the river of 5′ to 6′; the river course is very zig-zag, the bed very rocky. Also commencing from Narimogaru down to the junction with the Netravati the river has rocky bed with projecting boulders with winding and zig-zag course, deep and rapid gorges and drops.

Item 3—*Netravati.*—At Arbi obstruction about a mile below the Dharmasthala road crossing the river has a sudden fall of 15′ to 20′ and runs in deep rocky gorges with zig-zag course for a length of about 2 miles. There are similar difficult obstructions (1) about half a mile above Dharmasthala road crossing, (2) below the junction of Beltangadi hole (3) beyond Uppinangadi to the west, viz., Shripadi obstruction, (4) at Bantwal. But the worst of these is the one at Arbi.

(6) Considering the prohibitive cost of improvement of these rivers, Netravati in particular, the improvement of this river from Charmadi down to 37 miles on Shiradi road may be altogether dropped.

The cost of improvement to the Netravati below 37 miles on Shiradi road will be about Rs. 28,000.

(7) The estimates allow for clearing a channel 20′ wide to enable timber being floated. The rate allowed is the same as that for Paishwani river work.

(8) The six atlas sheets received with No. 949-S.K., dated 21st December 1921, are herewith returned.

(2)

General report to accompany the estimates for blasting rock and clearing obstructions in the rivers in Uppinangadi taluk.

[Amount of all estimates Rs. 5,88,500.]

These have been prepared as per reference from the Chief Conservator of Forests in his No. 298/20-2, dated 20th August 1921, requesting to inspect all the rivers in Uppinangadi taluk regarding their floating capabilities bearing Public Works Department Memorandum No. 1589/21-I.B.-1, dated 7th September 1921.

All the rivers as per the reference of the Conservator of Forests have been investigated by me with the help of Forest Guards guiding me along the margin, and estimates have been prepared for all the rivers except one, i.e., Shisla hole for which an estimate has been prepared till Parasurama Devasthanam and beyond Parasurama Devasthanam it is not possible to float since at Parapikallu where the river falls vertically by 20 feet and from there the river goes in deep gorges with steep rocky margin and with right-angular turnings at every fall. Below this Parapi for a length of 3½ miles the river goes in rocky gorges with many bed falls and zig-zag turnings. So the portion from Parasurama Devasthanam up to the junction with Netravati has been left out and the timber can easily be carted on road from Parasurama Devasthanam up to 37th mile on Siradi road and then floated in the Netravati.

Kallaje hole.—There are not much obstructions in the river except at few places and that too not difficult ones.

Kumaradhari.—The difficult portions are at (1) Yekkada, (2) below the junction with Gundia, (3) Viramangila, (4) Narimogaru commencement up to junction with Netravati.

Gundia hole.—There are only very few difficult obstructions in this river.

Netravati river.—The difficult portions are (1) half a mile above Dharmastala road crossing, (2) one mile below Dharmastala road crossing known as Arbi obstruction, (3) below the junction with Beltangadi hole, (4) Shripadi obstruction, (5) Bantwal obstruction.

Of all the above obstructions, Arbi obstruction is one of the difficult ones where the water falls vertically from 15 feet height and below for a length of two miles the river goes in rocky beds with zig-zag turnings and also with bed falls here and there.

Shisla hole.—There are not much rock from Shisla down to Parasurama devasthanam but there are lot of temporary dams built across the river for irrigation purposes.

The estimate provides for blasting rock and removing the same and also for erecting sheds for work people and storing materials tools and plants, etc. The rate allowed for in the estimate is as for Paishwani works in progress.

(3)

Endorsement by the Executive Engineer, West Coast division, No. 828-S.E., dated 20th July 1922.

Forwarded to Superintending Engineer, IV Circle, with maps showing the different names of the rivers dealt with. I have not been able to make any inspection of the rivers personally and inspection before the end of the monsoon would be useless. But from the Subdivisional Officer's report which is very clear, it seems that the Kumaradari river and the Gundia can be improved at a reasonable cost. While with regard to the others the cost seems prohibitive. Inspection will be possible probably about November or December next and I will then submit a further report if you think it necessary.

Order—No. 1456. Development. dated 4th November 1922.

In August 1921 the Chief Conservator of Forests submitted proposals that certain rivers in the Uppinangadi taluk in the South Kanara district should be investigated with a view to clearing the obstructions in their course in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation has been made by the Public Works Department and the total cost has been estimated to be Rs. 5,88,500. The Government consider that the operations on these river beds must await the investigation by the Chief Forest Engineer of the whole scheme for the development of the South Kanara forests.

2. The Chief Conservator of Forests is requested to submit a report as to the effect of similar operations undertaken in the Paishwani river with reference to G.O. No. 369-I., dated 20th November 1920.

(By order of the Governor in Council)

H. G. Stokes,
Acting Secretary to Government.

To the Chief Conservator of Fores...
,, Public Works Department (with estimates and one plan).
,, Publicity Officer.

Government of Madras

DEVELOPMENT DEPARTMENT

G.O. No. 1456, 4th November 1922

Forests—South Kanara district—Rivers—Floating facilities—Investigation—Dropped.

READ—the following papers:—

I

Letter from S. Cox, Esq., C.I.E., I.F.S., Chief Conservator of Forests, to the Secretary to Government, Development Department, dated Madras, the 20th August 1921, Ref. No. 298/20-2.

I have the honour to submit herewith for the orders of Government copy of a report, dated 18th July 1921, from the Conservator of Forests, Sixth Circle, proposing an examination of the main rivers in the South Kanara district with a view to improving their floating capabilities.

2. In this connexion reference is solicited to Mr. Tireman's report No. 517, dated 17th February 1920 (copy enclosed) on the scheme for development of the South Kanara forests. One of the proposals made by Mr. Tireman was that steps should be taken to facilitate floating, in the Kumharadari and Paishwani rivers. Government have already sanctioned an estimate for Rs. 4,000 for blasting and clearing obstructions in the Paishwani river—vide G.O. No. 369 I., dated 20th November 1920. Mr. Tireman now requests that orders may be issued for an examination of four other rivers in the ensuing dry weather, so that necessary works may be undertaken in due course to render these rivers also navigable for timber rafts. Should Government see no objection I request that orders may be issued to the Public Works Department to undertake an examination and report the result.

3. Mr. Tireman's report on the development of South Kanara forests referred to above, was informally discussed by the Executive Council in May 1920 and the proposals received general assent; but I refrained from placing them formally before Government until I was able to spare an officer for special duty to prepare a forest project for the whole district, a work which would take several months to complete. Mr. Tireman now hopes that with the help of the Forest Utilization Officer he will be able to prepare a scheme himself during the coming cold weather. Meanwhile, I request that orders may be issued for an examination of the rivers in the manner indicated by the Conservator.

ENCLOSURES

i)

Letter from the Conservator of Forests, Sixth Circle, Ootacamund, to the Chief Conservator of Forests, dated Ootacamund, the 18th July 1921, No. Ref. M. 344/21-1.

In connexion with my proposals for the development of the South Kanara forests (vide my C. No. 517/20-1, dated 17th February 1920) it will be necessary to examine the main rivers in that district with a view to improving their floating capabilities and I request that Government may be addressed with a view to such an examination being commenced during the ensuing dry weather. The following rivers will require examination:—

(1) The Kumaradhari river from the junction of the Kallaje and Adi-Holes to Uppinangadi about thirty-two miles.

(2) The Gundia river from Gundia to its junction with No. 1 about sixteen miles.

(3) The Netravati river and its affluent the Charmadi river from Charmadi to Uppinangadi about twenty-four miles.

(4) The Shishla river from Shishla to its junction with No. 3 about fifteen miles.

These four rivers are in the Uppinangadi taluk. There are several in the more northern taluks, but before I ask for their examination I should prefer to see something of the country. The examination of the four rivers named will probably be as much as can be done in one season

(ii)

Letter from the Conservator of Forests, Western Circle, Coimbatore, to the Chief Conservator of Forests, dated Coimbatore, the 17th February 1920, No. 517.

I have the honour to report that I have now seen a fair proportion of the forests in the South Mangalore Division and to put forward the following proposals for their future treatment. The object of my two visits—one to the Paishwani river valley, and the other to the forests in the basin of the Netravati on the Mangalore–Shiradi road—was to ascertain whether there was any prospect of a big scheme of exploitation. This may at once be ruled out of the question as the forests have almost all been subjected to kumri in the not very distant past, and are on the whole of poor quality. Small patches of very fine evergreen forest do exist having evidently escaped kumri, and there are also patches containing deciduous timber of large size which presumably have not been kumried for a long period of years. Mr. W. C. Hart, Extra Assistant Conservator of Forests, who, a few years ago, was engaged in preparing working-plans for the forests of Paishwani and Kumharadari valleys examined these patches both evergreen and deciduous in some detail and estimated their extent at about 17,000 acres. He further estimated that the over-mature stock therein amounted to something like 120,000 tons of timber; making due allowance for over-sanguine estimates, if only these patches formed one or two compact blocks it would be possible to embark on a big scheme of exploitation, but unfortunately they are scattered over something like 250,000 acres and are for the most part of small extent, the largest measuring about 4,000 acres. Concentration, with which alone any exploitation scheme on a large scale would be profitable, is thus out of the question, and a further adverse feature is the fact that the patches are not all situated in the same river basin.

2. There are however endless possibilities for the future. The state here possesses a very large and compact area of forest extending over some 250,000 acres. I have no doubt whatever that the greater part if not the whole of this was once covered with magnificent evergreen forest. My reasons for holding this opinion are, firstly that from a careful study of the factors governing the distribution of evergreen and deciduous forest I am convinced that in this climate with an annual rainfall of upwards of 200 inches the forests are always evergreen unless they have been subjected to fire or are situated on very shallow soil, secondly the existence of the evergreen patches referred to above which carry as fine a stand of timber as I have seen in any forest and which in no way differ as regards the factors of the locality from the surrounding country which we know to have been subject to kumri, thirdly the fact that in most of the valleys which, though almost certainly kumried in the past, retain in such a damp climate a considerable quantity of moisture throughout the hot weather, thus escaping the annual fires which sweep over the drier hill sides, the forest is evergreen with occasional large trees of Vateria indica and Hopea vightiana, and lastly the fact that in the forests which have been protected from fire an evergreen undergrowth is gradually spreading under the deciduous trees. Whether I am right or wrong however I think that there can be no doubt that an evergreen crop in this locality is to be preferred to a deciduous one owing to the greater stand of timber, the better quality of evergreen trees as regards soundness, and the fact that an evergreen crop requires less attention than a deciduous one. In parenthesis it would be as well to say that I have seen no land suitable for growing teak.

3. Despite the absence hitherto of much systematic research into the sylviculture of the evergreen species sufficient is known regarding certain species to make it a matter of practical certainty that they can be successfully cultivated in the forest tract under consideration. I refer to Hopea parviflora, Vateria indica, Artocarpus hirsuta and mango. Hopea has been cultivated for generations by the ryots of Kanara, and it has of recent years been sown in several places under a deciduous crop. I have seen several of these sowings and have found only one failure which was due to the choking of the seedlings by a dense growth of Strobilanthus the result of a severe opening of the canopy, and of subsequent absence of attention. Vateria indica is commonly planted or sown in Kanara as an avenue tree, and I have moreover successfully raised it under deciduous shade in Coorg though only on an experimental scale. Artocarpus hirsuta will grow anywhere on the west coast. I have raised it in Coorg in a fairly large scale in the open and on a small scale under shade, and I saw in Kanara some very promising sowings. Mango is one of the easiest trees to grow from seed. A forest composed of these species will be extremely valuable; two of them yield timber of the very first quality which moreover is highly prized in the local markets, while the other two yield excellent box-making timber.

4. There being therefore little doubt as to the possibility of replacing the existing poor stock—consisting chiefly of badly grown Xylia, Terminalia tomentosa and Terminalia paniculata—by the species enumerated above, or of the subsequent value of a crop consisting thereof, I recommend that steps be taken to stock as large an area as possible with them. I cannot specify at present the area which can be dealt with annually, but in order to lose no time I have already given orders that 1,000 acres are to be sown this year and in a short time it should be possible to draw up a definite scheme of working. Sowing is a cheap method, and I see no reason—given sufficient establishment—why we should not eventually restock one-hundredth part of the area (i.e., about 2,500 acres) every year. An inspection of any evergreen forest will show that the species selected come to no harm if the seedlings are left to themselves, and there is thus

no reason why sowing should not proceed in advance of the tending which of course will subsequently be required to establish the young crop. In any case if this view proves to be wrong not much harm will have been done. Later on when we know more about them we can introduce other evergreen species. I would not sow the evergreen crop in places where there is a really good young crop already on the ground of the valuable deciduous species. Such young crops chiefly Xylia occur occasionally in patches.

5. It will be necessary when this is possible to increase the establishment to an extent which will permit of tending the whole of the crop to be sown, i.e., possibly 2,500 acres per annum and of extracting the timber which will be felled in the course of the tending. From experience of similar work in Coorg where, though the old crop is much more valuable, the young crop consisting of teak, rosewood, and Pterocarpus is much more costly to raise, I think it will be found that the timber which will be extracted in the interests of the young crop will more than cover the cost of establishing the latter even leaving out of account the patches containing fine timber. Including these latter the net result should show a fair profit, and the new crop should thus be established at no cost. To extract the timber at a profit however it is imperative to improve the rivers so as to facilitate floating which at present both in the Kumharadari and Paishwani rivers is very difficult and costly. Mr. Peddie of the Public Works Department has recently prepared an estimate for improving the Paishwani and I recommend that the work should be sanctioned and put in hand during the next dry weather. I also recommend that Government be asked at once to depute an officer to examine the Kumharadari river this dry weather and to submit an estimate for its improvement.

6. When the Paishwani has been improved and it should be possible to do this before the floating season of 1921 a large quantity of timber can be extracted from the over-mature patches in this valley commencing with the Jalsur East reserved forest where fellings as prescribed in Mr. Hart's working-plan are now in progress, although, owing to the difficulty in floating, the possibility laid down by him cannot be worked up to. He prescribed merely selection fellings. I propose to fell much more heavily and in fact to carry out fellings under the uniform method on the lines of those which you saw in Coorg. Mr. Hart estimates the possibility under his method at about 11,000 tons from about 400 acres. Under the uniform method it should be a good deal more but making allowances for unduly sanguine estimates and retaining Mr. Hart's figure there is ample work to keep the establishment employed for a couple of years or more.

7. In addition to the river training works it will be necessary largely to increase the dragging facilities in the Jalsur East and the other larger areas of good timber. I propose that the American Consulting Forest Engineer should be taken to the Paishwani valley and asked for his opinion, but the country is fairly easy and in the meantime I am in favour of constructing a considerable length of drag paths in the Jalsur East reserved forest in order that large quantities of timber can be dragged down to the Kandaka stream, a tributary of the Paishwani, which skirts the reserve, in time to be floated in the monsoon of 1921. Ranger Swamikutti could, I think, easily carry out the work of aligning these paths, and there is no reason why considerable progress should not be made next monsoon. With a good system of drag paths I foresee no difficulty in dragging by means of elephants and buffaloes or possibly a tractor a much larger quantity of timber than has yet been attempted.

8. I have alluded more than once to the question of establishment. My ideas on the subject are possibly on the large side, but I feel that here we have a property of very great potential value and if the Forest department is to justify its existence it is high time we set about to put that property into the best possible condition and to make two or more trees grow where only one grew before. The existing establishment is based on the works at present in progress. These are chiefly works of exploitation and have been inaugurated from time to time in various localities in a somewhat haphazard manner; no review of the needs of the forests as a whole has ever been undertaken as far as I am aware, nor have proposals on any serious scale ever been made to develop the valuable property aforesaid. I have not yet seen the forests of North Mangalore, but I gather that with the exception of the fuel, catechu and sandalwood reserves of the Coondapoor and Udipi ranges the greater part is in much the same condition as the forests of the South Division and that the area of such forest is about 150,000 acres. We thus have 400,000 acres to deal with, or on a provisional rotation of 100 years 4,000 acres per annum to stock with a young crop and to clear of the existing one. I do not think that one Ranger can deal efficiently with the sowing, tending and fire-protection of more than 500 acres per annum, and as I very roughly estimate that the old crop will yield on the average 12 tons per acre (which means 6,000 tons off 500 acres) I think that another ranger will be required for the exploitation of this quantity of timber. Thus 16 rangers will in the not very distant future be required for the 400,000 acres of timber forest with possibly two more for fuel, catechu, and sandalwood or 18 in all, as compared with the present establishment of 7. It will also be necessary to form another division, two District Forest Officers each probably dealing with an annual regeneration area of 1,600 acres and the third with one of 800 acres in addition to the fuel, catechu and sandal work. As things are at present it is useless going into the question of the territorial arrangement of the divisions and ranges, nor do I propose to deal with the lower subordinate establishment which will be required. If my proposals are generally accepted the District Forest Officer can work out details.

9. The South Division is very badly off in the matter of buildings; if the work which I am now advocating is to be properly done it will be necessary for forest officers in future to

stay in one place for several days at a time; in the case of the local fund sheds they can never be sure of not being turned out, and these sheds are for the most part miserable affairs and usually located in the most malarious places—presumably in order to obtain water easily. Considerable expenditure therefore will be necessary in order to provide comfortable and healthy quarters for the District Forest Officer, Rangers, Foresters and Guards. Communications also are very inadequate. The good roads all run east and west across the forests and although there is a road running more or less through the forests northwards from Jalsur to near Beltangadi in three sections with a total length of about 50 miles, it is impassable for a motor-car for most of the year, and even for carts for a considerable part of the year. It is essential that we should have a road passable for a car except during heavy floods and I advocate improving this road accordingly. It will also be necessary to construct a number of subsidiary fair weather roads. This would probably cost in all about Rs. 2 lakhs while another sum of about Rs. 1 lakh will be required for buildings. In the North Division which I have not yet seen possibly Rs. 2 lakhs would be required for similar work, while propably Rs. 2 lakhs would be required in both divisions together for river improvement work. The total outlay would thus be in the neighbourhood of Rs. 7 lakhs. This does not make provision for dragpaths and carting roads for extracting timber to the rivers; the country is as a rule fairly easy and these should not cost very much; their cost will moreover be covered almost immediately by the sale-proceeds of the timber extracted. The Rs. 7 lakhs referred to represent a capital investment. My figures are of course very rough; details have to be worked out by the District Forest Officers.

10. Seven lakhs is perhaps a somewhat alarming figure compared with what the department is accustomed to spend, but the district has been starved in the past. The total expenditure in the whole district (North and South Divisions) during the last twenty years has been on roads and bridges Rs. 27,763; on buildings Rs. 58,435; on sowing and planting Rs. 5,154; and on other works of improvement (A. VIII. g) Rs. 17,631; and annual average on works of improving the forest (exclusive of protection from fire) of Rs. 5,449. With expenditure on these lines we are not going to make much progress.

11. On the modest estimate of 12 tons to the acre referred to in paragraph 8 the annual yield obtained by working 4,000 acres per annum would be 48,000 tons. A very low estimate of the net profit obtainable on this is Rs. 10 per ton which means an annual profit of nearly Rs. 5 lakhs; this after paying for the necessary sylvicultural work and establishment (perhaps Rs. 2-lakhs) would in the course of a very few years repay all the capital invested. It must also be remembered that the existing crop is growing larger every year and that the annual yield will thus gradually increase.

12. In the immediate future I propose as outlined in paragraphs 4 to 7 to sow 1,000 acres per annum in the South Division, to render floating in the Kumaradari and Paishwani rivers easy, and to extract as much timber as possible from the Jalsur East reserve. For this at least one additional ranger is required, and the District Forest Officer is now preparing proposals to split the existing unwieldy Uppinangadi range which covers 154,000 acres. I am also giving orders to have 1,000 acres sown this year in the North Division. I also propose to close down the various scattered works such as improvement fellings, climber cuttings and the like which are now proceeding in what I have called a somewhat haphazard manner, and to concentrate all the energies of the division of the new work. Fire protection of the sown area will be a sine qua non and I am calling on the District Forest Officer to submit proposals. As regards the North Division I hope to tour there next year and to work out some definite details as to what is required.

13. If you agree with my views I request that you will put my letter before Government. I think that it should know what a potentiality fine property it possesses in its South Kanara forests and be requested to state whether it is prepared to make the outlay necessary to put that property into order. In any case the outlay is not likely to be more than about Rs. 2 per acre, and this will probably very soon be recouped. My scheme is not—as I had hoped—one which is going to bring in a large return at an early date, but the owner of a forest property must look a long way ahead; in this case the return though long deferred should be a very fine one.

II

Official Memorandum No. 1589/21-I.B.-1, Public Works, dated 7th September 1921.

A copy of the letter from the Chief Conservator of Forests, Reference No. 298–20–2, dated 20th August 1921, together with its enclosure is herewith forwarded to the Superintending Engineer, IV Circle, who is requested to arrange for an early examination of the four rivers referred to therein with a view to improving thei floating capabilities and submit a report on the subject.

(By order)

R. NARASIMHA AYYANGAR,
Under Secretary to Governme

To the Superintending Engineer, IV Circle.

III

Letter from P. Hawkins, Esq., M. Inst. c.e., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated Coimbatore, the 11th August 1922, No. 239-I.

With reference to your Memorandum No. 1589/21–I.B.-1, dated 7th September 1921, I have the honour to forward herewith the marginally-noted five estimates aggregating to Rs. 5,88,500 together with a preliminary report submitted by the Subdivisional Officer and a tracing. On the basis of the standard of clearance adopted the Kumaradhari and Gundia rivers can be cleared fairly easily while the others would be expensive.

	Rs.
(1) Blasting rock and clearing obstructions in the Kallaja hole	5,000
(2) Blasting rock and clearing obstructions in the Kumaradhari hole	1,90,000
(3) Blasting rock and clearing obstructions in the Gundia hole	33,000
(4) Blasting rock and clearing obstructions in the Netravati river	3,55,000
(5) Blasting rock and clearing obstructions in the Shisla hole	5,500

The amount of clearance which the Forest department would require is, however, not quite certain. Much would depend upon the season of the year at which their rafting operations would be undertaken. I have instructed the Executive Engineer to consult the Forest department on this point with a view to fix the level down to which a channel should be cleared, and am also consulting the Conservator of Forests, Sixth Circle.

I am sending you separately a report of progress on the Paishwani river, which has been satisfactory.

Enclosures

(1)

Letter from the Assistant Engineer, South Kanara subdivision, dated the 10th July 1922 No. 738-E.

Report on floating capabilities of certain rivers in Uppinangadi taluk.

I submit herewith the report received from Overseer M.R.Ry. S. Nanjunda Ayyar on the investigation of the four rivers specified in the letter from the Conservator of Forests, Sixth Circle. I regret I had no opportunity to examine the rivers which I wished to do after the receipt of his report, but having to attend to the Paishwani river work he could not submit it earlier. It is now too late to examine the rivers owing to freshes.

2. To enable the floating of timber the rivers have to be improved at a prohibitive cost—approximate estimates are attached :—

(1) (*a*) Kallaja hole for a length of 9 miles above its junction with the Kumaradhari—Rs. 5,000.

This was included in the investigation as decided by the Chief Conservator of Forests during the conference held in December last.

(*b*) The Kumaradhari from the infall of Kallaja hole down to Uppinangadi—about 32 miles—Rs. 1,90,000.

(2) The Gundia from Gundia down to its junction with the Kumaradhari—length about 16 miles—Rs. 33,000.

(3) The Netravati and its affluent Charmadi hole from Charmadi down to Panemangalore—Rs. 3,55,000.

The portion between Uppinangadi and Panemangalore which will cost about Rs. 20,000 was included as decided at the conference. This will be necessary in case the Kumaradhari alone is to be improved.

(4) The Shisla from Shisla to Parasurama devasthanam—a distance of about 8 miles—Rs. 5,500.

Below Parasurama devasthanam it will not be possible to float timber since at Parapikallu obstruction the river has a sudden fall of 20 feet, and below the river runs in deep and rocky gorges with zig-zag course and sudden drops with right angle bend at every fall for a length of about 3½ miles. Even if it be possible to improve the river the cost will be too prohibitive. Therefore the portion below Parasurama devasthanam has been omitted. Timber may be floated down from Shisla to the above point whence it may be carted to 37 miles on Shiradi road. From there it can be sent down the Netravati.

(5) The obstructions in items 1 (*a*), 2 and 4 are in no way formidable.

Item 1 (*b*)—*Kumaradhari.*—At Yakkadka, below the junction of Gundia and at Viramangila there are drops in the river of 5′ to 6′; the river course is very zig-zag, the bed very rocky. Also commencing from Narimogaru down to the junction with the Netravati the river has rocky bed with projecting boulders with winding and zig-zag course, deep and rapid gorges and drops.

Item 3—*Netravati.*—At Arbi obstruction about a mile below the Dharmasthala road crossing the river has a sudden fall of 15′ to 20′ and runs in deep rocky gorges with zig-zag course for a length of about 2 miles. There are similar difficult obstructions (1) about half a mile above Dharmasthala road crossing, (2) below the junction of Beltangadi hole (3) beyond Uppinangadi to the west, viz., Shripadi obstruction, (4) at Bantwal. But the worst of these is the one at Arbi.

(6) Considering the prohibitive cost of improvement of these rivers, Netravati in particular, the improvement of this river from Charmadi down to 37 miles on Shiradi road may be altogether dropped.

The cost of improvement to the Netravati below 37 miles on Shiradi road will be about Rs. 28,000.

(7) The estimates allow for clearing a channel 20′ wide to enable timber being floated. The rate allowed is the same as that for Paishwani river work.

(8) The six atlas sheets received with No. 949-S.K., dated 21st December 1921, are herewith returned.

(2)

General report to accompany the estimates for blasting rock and clearing obstructions in the rivers in Uppinangadi taluk.

[Amount of all estimates Rs. 5,88,500.]

These have been prepared as per reference from the Chief Conservator of Forests in his No. 298/20–2, dated 20th August 1921, requesting to inspect all the rivers in Uppinangadi taluk regarding their floating capabilities bearing Public Works Department Memorandum No. 1589/21-I.B.-1, dated 7th September 1921.

All the rivers as per the reference of the Conservator of Forests have been investigated by me with the help of Forest Guards guiding me along the margin, and estimates have been prepared for all the rivers except one, i.e., Shisla hole for which an estimate has been prepared till Parasurama Devasthanam and beyond Parasurama Devasthanam it is not possible to float since at Parapikallu where the river falls vertically by 20 feet and from there the river goes in deep gorges with steep rocky margin and with right-angular turnings at every fall. Below this Parapi for a length of 3½ miles the river goes in rocky gorges with many bed falls and zig-zag turnings. So the portion from Parasurama Devasthanam up to the junction with Netravati has been left out and the timber can easily be carted on road from Parasurama Devasthanam up to 37th mile on Siradi road and then floated in the Netravati.

Kallaje hole.—There are not much obstructions in the river except at few places and that too not difficult ones.

Kumaradhari.—The difficult portions are at (1) Yekkada, (2) below the junction with Gundia, (3) Viramangila, (4) Narimogaru commencement up to junction with Netravati.

Gundia hole.—There are only very few difficult obstructions in this river.

Netravati river.—The difficult portions are (1) half a mile above Dharmastala road crossing, (2) one mile below Dharmastala road crossing known as Arbi obstruction, (3) below the junction with Beltangadi hole, (4) Shripadi obstruction, (5) Bantwal obstruction.

Of all the above obstructions, Arbi obstruction is one of the difficult ones where the water falls vertically from 15 feet height and below for a length of two miles the river goes in rocky beds with zig-zag turnings and also with bed falls here and there.

Shisla hole.—There are not much rock from Shisla down to Parasurama devasthanam but there are lot of temporary dams built across the river for irrigation purposes.

The estimate provides for blasting rock and removing the same and also for erecting sheds for work people and storing materials tools and plants, etc. The rate allowed for in the estimate is as for Paishwani works in progress.

(3)

Endorsement by the Executive Engineer, West Coast division, No. 828-S.E., dated 20th July 1922.

Forwarded to Superintending Engineer, IV Circle, with maps showing the different names of the rivers dealt with. I have not been able to make any inspection of the rivers personally and inspection before the end of the monsoon would be useless. But from the Subdivisional Officer's report which is very clear, it seems that the Kumaradari river and the Gundia can be improved at a reasonable cost. While with regard to the others the cost seems prohibitive. Inspection will be possible probably about November or December next and I will then submit a further report if you think it necessary.

Order—No. 1456, Development, dated 4th November 1922.

In August 1921 the Chief Conservator of Forests submitted proposals that certain rivers in the Uppinangadi taluk in the South Kanara district should be investigated with a view to clearing the obstructions in their course in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation has been made by the Public Works Department and the total cost has been estimated to be Rs. 5,88,500. The Government consider that the operations on these river beds must await the investigation by the Chief Forest Engineer of the whole scheme for the development of the South Kanara forests.

2. The Chief Conservator of Forests is requested to submit a report as to the effect of similar operations undertaken in the Paishwani river with reference to G.O. No. 369 I., dated 20th November 1920.

(By order of the Governor in Council)

H. G. Stokes,
Acting Secretary to Government.

To the Chief Conservator of Forests.
,, Public Works Department (with estimates and one plan).
,, Publicity Officer.

DEVELOPMENT DEPARTMENT.

NOTES CONNECTED WITH G.O. No. 1456, DEVELOPMENT, DATED 4TH NOVEMBER 1922.

[SUBJECT.—*South Kanara forests—Examination of the rivers for forest exploitation.*]

From the Chief Conservator of Forests, Ref. No. 298-20-2, *dated the* 20*th August* 1921.

Please see the Chief Conservator's letter. Submitted that the Public Works Department (Irrigation) may be requested to issue orders for examining the four rivers mentioned in Mr. Tireman's letter dated 18th July 1921 with a view to improving their floating capabilities.

R.V.—30-8-21.

K. NAGESWARA RAO—2-9-21.
J. M. TURING—2-9-21.

PUBLIC WORKS (IRRIGATION) DEPARTMENT.

Please see the letter from the Chief Conservator of Forests and the Development Department note above. A copy of the letter with its enclosures may be sent to the Superintending Engineer, IV Circle, for report of the floating capabilities of the four rivers mentioned therein. A draft endorsement to the Superintending Engineer is accordingly submitted for approval and orders for issue. The Superintending Engineer will be reminded after two months.

T.S.R.—6-9-21.

R. NARASIMHA AYYANGAR—7-9-21
A. H. MORIN—2-9-21

[Memorandum No. 1589/21 I.B., dated 7th September 1921.]

From the Superintending Engineer, IV Circle, No. 239 *I., dated* 11*th August* 1922.

Submitted for orders if the estimates submitted by the Superintending Engineer may be examined in Technical section. No preliminary report has been received with the estimates These estimates were called for with reference to paragraphs 2 and 3 of the letter from the Chief Conservator of Forests. If it is not considered necessary to check the estimates, the file may be sent to the Development Department for remarks as to further action to be taken.

T.S.R.—15-8-22.

The preliminary report which is missing may be called for.

R.N.—13-8-22. A.H.M.—15-8-22.

A draft memorandum to the Superintending Engineer, IV Circle, calling for the missing preliminary report for the work is submitted for approval.

2. A report of the progress of work on the Paishwani river promised by the Superintending Engineer in his letter No. 239 I., dated 11th August 1922, has now been received and is put up in the linked file.

G.V.—22-8-22. R.N.—22-8-22.

The file may be sent to Development for remarks. The cost seems to be prohibitive.

R.N.—5-9-22. A.H.M.—5-9-22

DEVELOPMENT DEPARTMENT.

Last year the Chief Conservator requested that the Public Works Department may be asked to make an examination of certain rivers in the South Kanara district with a view to improving their floating capabilities. This formed part of a scheme which the Chief Conservator had on hand for the development of South Kanara forests. The rivers have been examined by the Public Works Department who reported that the estimated cost of improving them is Rs. 5,88,500.

2. The Chief Conservator has since submitted his report on the development of South Kanara forests and he has been informed that the scheme is too ambitious and that it should lie over until the exploitation branch is in a position to tackle it. Perhaps the proposal in this file may also lie over for the present.

The file may be sent to the Chief Conservator for perusal with the concurrence of the Public Works Department.

S.R.R.—11-9-22.

K. NAGESWARA RAO—12-9-22.

H. G. STOKES—13-9-22.

OFFICE OF THE CHIEF CONSERVATOR OF FORESTS.

The cost of the larger schemes is so great that there is no use proceeding further with them until the new Engineering branch has had an opportunity of examining the whole project for exploiting the Kanara forests.

2. Meanwhile the comparatively cheap scheme for the improvement of the Netravati below 37/0 miles on the Shiradi road should be proceeded with. This will cost about Rs. 28,000. A fair quantity of timber is extracted from 37/0 miles on the Shiradi road. At present there is no very great difficulty in floating this timber with the help of bamboos, but the bamboos are fast dying and in another year or two there will be none left. If extraction of timber is to go on it will be necessary to float it with the help of boats, the logs being lashed alongside on both sides. This cannot be done unless the existing passages through the rocks are widened. If the work of improving the reach in question is done a much larger quantity of timber can be extracted than is dealt with now, and the cost (Rs. 28,000) will soon be recouped.

H. TIREMAN—3-10-22.

DEVELOPMENT DEPARTMENT.

The Chief Conservator's proposal may be supported and the file passed on to Public Works Department. It is believed that the necessary funds will be provided for in that department's budget.

K.N.R.—10-10-22.

The proposals in this file relate to a suggestion made in 1921 by the Chief Conservator of Forests that certain rivers in the Uppinangadi taluk in South Kanara should be investigated with a view to clearing the obstructions in their course, in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation of the rivers has been made under the orders of the Public Works Department but I observe that no officer higher than an overseer has made the investigation or has inspected the rivers. The total cost is put down at Rs. 5,88,500. It is distributed as follows:—

	RS.
(1) On the Kumaradhari river two schemes—one at Rs. 5,000 and the other at Rs. 1,90,000	1,95,000
(2) On the Gudia river	33,000
(3) The Netravati	3,55,000
(4) The Shishla river	5,500
Total	5,88,500

The Chief Conservator of Forests recommends in his note of 3rd October 1922 that only one portion, namely, on the Netravati from a point on the Shiradi road at the 37th mile downwards should be undertaken at a cost of Rs. 28,000.

2. In my opinion no money should be spent upon these works at all, until the whole question of the exploiting of these forests on a commercial scale has been gone into by the special staff under the Chief Forest Engineer and staff whom we expect in 1923–24. C-4 will remember that we have declined to include in the budget for 1923–24 an ambitious scheme of expenditure for the exploitation of these forests which Mr. Tireman proposed to include in the budget and until the prospects of that scheme are adequately investigated by the expert lumbering staff, I consider that money should not be spent upon interference with these rivers. It is, of course, out of question for financial reasons to embark upon an expenditure so extravagant as Rs. 5,88,500 which is now indicated. A further reason which renders it desirable in my opinion that we should not interfere with these rivers until we have had the benefit of the examination of the question by the special lumbering engineers, is that there is some reason to doubt whether in schemes of this kind it is sufficient simply to clear away the obstructions and provide a clear run through for the rafts which have to descend the stream. Since 1920 the Public Works Department has been at work in clearing the Paishwani river which, I believe, is the river which flows from the Nilambur area, an estimate of Rs. 34,900 having been sanctioned in that year. I have been informed orally by Mr. Tireman that the principal effect of these operations (I presume by increasing the rapidity of the run off of the river) has been to reduce the average level of the water in it so as to render the rafting of timber very much more difficult than before. If that is correct, it would seem that the clearance of these streams is by no means so simple a matter as might have been supposed and probably requires very much more close investigation and more specialised knowledge than the Public Works Department have yet been able to bring to bear upon it. In any case, the investigation by an overseer does not appear to me to be a satisfactory basis upon which to embark upon a matter of this kind. I consider therefore that the Chief Conservator should be told that the operations on these river beds must await the investigation of the Chief Forest Engineer and the development of the scheme for exploiting the Kanara jungles and I think we must call for a report from him as to the effect of the similar operations which have been undertaken in the Paishwani.

H. G. STOKES—11-10-22.

I quite agree.

A. R. K[NAPP]—15-10-22.

A draft order is submitted for approval. It may be sent to the Public Works Department for acceptance.

S.R.R.—17-10-22.

K. NAGESWARA RAO—18-10-22.

H.G.S.—20-10-22.

PUBLIC WORKS (IRRIGATION) DEPARTMENT.

The draft order may be accepted in this department and the file returned to Development.

T.S.R.—24-10-22.

R. NARASIMHA AYYANGAR—24-10-22.

A. H. MORIN—30-10-22.

DEVELOPMENT DEPARTMENT.

The draft order put up may issue.

K.N.R.—2-11-22. H.G.S.—3-11-22.

[G.O. No. 1456, Development, dated 4th November 1922.]

Government of Madras

DEVELOPMENT DEPARTMENT

G.O. No. 1456. 4th November 1922

Forests—South Kanara district—Rivers—Floating facilities—Investigation—Dropped.

READ—the following papers:—

Letter from S. Cox, Esq., C.I.E., I.F.S., Chief Conservator of Forests, to the Secretary to Government, Development Department, dated Madras, the 20th August 1921, Ref. No. 298/20-2.

I have the honour to submit herewith for the orders of Government copy of a report, dated 18th July 1921, from the Conservator of Forests, Sixth Circle, proposing an examination of the main rivers in the South Kanara district with a view to improving their floating capabilities.

2. In this connexion reference is solicited to Mr. Tireman's report No. 517, dated 17th February 1920 (copy enclosed) on the scheme for development of the South Kanara forests. One of the proposals made by Mr. Tireman was that steps should be taken to facilitate floating, in the Kumharadari and Paishwani rivers. Government have already sanctioned an estimate for Rs. 4,000 for blasting and clearing obstructions in the Paishwani river—vide G.O. No. 369 I., dated 20th November 1920. Mr. Tireman now requests that orders may be issued for an examination of four other rivers in the ensuing dry weather, so that necessary works may be undertaken in due course to render these rivers also navigable for timber rafts. Should Government see no objection I request that orders may be issued to the Public Works Department to undertake an examination and report the result.

3. Mr. Tireman's report on the development of South Kanara forests referred to above, was informally discussed by the Executive Council in May 1920 and the proposals received general assent; but I refrained from placing them formally before Government until I was able to spare an officer for special duty to prepare a forest project for the whole district, a work which would take several months to complete. Mr. Tireman now hopes that with the help of the Forest Utilization Officer he will be able to prepare a scheme himself during the coming cold weather. Meanwhile, I request that orders may be issued for an examination of the rivers in the manner indicated by the Conservator.

ENCLOSURES

(i)

Letter from the Conservator of Forests, Sixth Circle, Ootacamund, to the Chief Conservator of Forests, dated Ootacamund, the 18th July 1921, No. Ref. M. 344/21-1.

In connexion with my proposals for the development of the South Kanara forests (vide my C. No. 517/20-1, dated 17th February 1920) it will be necessary to examine the main rivers in that district with a view to improving their floating capabilities and I request that Government may be addressed with a view to such an examination being commenced during the ensuing dry weather. The following rivers will require examination:—

(1) The Kumaradhari river from the junction of the Kallaje and Adi-Holes to Uppinangadi about thirty-two miles.

(2) The Gundia river from Gundia to its junction with No. 1 about sixteen miles.

(3) The Netravati river and its affluent the Charmadi river from Charmadi to Uppinangadi about twenty-four miles.

(4) The Shishla river from Shishla to its junction with No. 3 about fifteen miles.

These four rivers are in the Uppinangadi taluk. There are several in the more northern taluks, but before I ask for their examination I should prefer to see something of the country. The examination of the four rivers named will probably be as much as can be done in one season.

(ii)

Letter from the Conservator of Forests, Western Circle, Coimbatore, to the Chief Conservator of Forests, dated Coimbatore, the 17th February 1920, No. 517.

I have the honour to report that I have now seen a fair proportion of the forests in the South Mangalore Division and to put forward the following proposals for their future treatment. The object of my two visits—one to the Paishwani river valley, and the other to the forests in the basin of the Netravati on the Mangalore–Shiradi road—was to ascertain whether there was any prospect of a big scheme of exploitation. This may at once be ruled out of the question as the forests have almost all been subjected to kumri in the not very distant past; and are on the whole of poor quality. Small patches of very fine evergreen forest do exist having evidently escaped kumri, and there are also patches containing deciduous timber of large size which presumably have not been kumried for a long period of years. Mr. W. C. Hart, Extra Assistant Conservator of Forests, who, a few years ago, was engaged in preparing working-plans for the forests of Paishwani and Kumbaradari valleys examined these patches both evergreen and deciduous in some detail and estimated their extent at about 17,000 acres. He further estimated that the over-mature stock therein amounted to something like 120,000 tons of timber; making due allowance for over-sanguine estimates, if only these patches formed one or two compact blocks it would be possible to embark on a big scheme of exploitation, but unfortunately they are scattered over something like 250,000 acres and are for the most part of small extent, the largest measuring about 4,000 acres. Concentration, with which alone any exploitation scheme on a large scale would be profitable, is thus out of the question, and a further adverse feature is the fact that the patches are not all situated in the same river basin.

2. There are however endless possibilities for the future. The state here possesses a very large and compact area of forest extending over some 250,000 acres. I have no doubt whatever that the greater part if not the whole of this was once covered with magnificent evergreen forest. My reasons for holding this opinion are, firstly that from a careful study of the factors governing the distribution of evergreen and deciduous forest I am convinced that in this climate with an annual rainfall of upwards of 200 inches the forests are always evergreen unless they have been subjected to fire or are situated on very shallow soil, secondly the existence of the evergreen patches referred to above which carry as fine a stand of timber as I have seen in any forest and which in no way differ as regards the factors of the locality from the surrounding country which we know to have been subject to kumri, thirdly the fact that in most of the valleys which, though almost certainly kumried in the past, retain in such a damp climate a considerable quantity of moisture throughout the hot weather, thus escaping the annual fires which sweep over the drier hill sides, the forest is evergreen with occasional large trees of Vateria indica and Hopea vightiana, and lastly the fact that in the forests which have been protected from fire an evergreen undergrowth is gradually spreading under the deciduous trees. Whether I am right or wrong however I think that there can be no doubt that an evergreen crop in this locality is to be preferred to a deciduous one owing to the greater stand of timber, the better quality of evergreen trees as regards soundness, and the fact that an evergreen crop requires less attention than a deciduous one. In parenthesis it would be as well to say that I have seen no land suitable for growing teak.

3. Despite the absence hitherto of much systematic research into the sylviculture of the evergreen species sufficient is known regarding certain species to make it a matter of practical certainty that they can be successfully cultivated in the forest tract under consideration. I refer to Hopea parviflora, Vateria indica, Artocarpus hirsuta and mango. Hopea has been cultivated for generations by the ryots of Kanara, and it has of recent years been sown in several places under a deciduous crop. I have seen several of these sowings and have found only one failure which was due to the choking of the seedlings by a dense growth of Strobilanthus the result of a severe opening of the canopy, and of subsequent absence of attention. Vateria indica is commonly planted or sown in Kanara as an avenue tree, and I have moreover successfully raised it under deciduous shade in Coorg though only on an experimental scale. Artocarpus hirsuta will grow anywhere on the west coast. I have raised it in Coorg in a fairly large scale in the open and on a small scale under shade, and I saw in Kanara some very promising sowings. Mango is one of the easiest trees to grow from seed. A forest composed of these species will be extremely valuable; two of them yield timber of the very first quality which moreover is highly prized in the local markets, while the other two yield excellent box-making timber.

4. There being therefore little doubt as to the possibility of replacing the existing poor stock—consisting chiefly of badly grown Xylia, Terminalia tomentosa and Terminalia paniculata—by the species enumerated above, or of the subsequent value of a crop consisting thereof, I recommend that steps be taken to stock as large an area as possible with them. I cannot specify at present the area which can be dealt with annually, but in order to lose no time I have already given orders that 1,000 acres are to be sown this year and in a short time it should be possible to draw up a definite scheme of working. Sowing is a cheap method, and I see no reason—given sufficient establishment—why we should not eventually restock one-hundredth part of the area (i.e., about 2,500 acres) every year. An inspection of any evergreen forest will show that the species selected come to no harm if the seedlings are left to themselves, and there is thus

no reason why sowing should not proceed in advance of the tending which of course will subsequently be required to establish the young crop. In any case if this view proves to be wrong not much harm will have been done. Later on when we know more about them we can introduce other evergreen species. I would not sow the evergreen crop in places where there is a really good young crop already on the ground of the valuable deciduous species. Such young crops chiefly Xylia occur occasionally in patches.

5. It will be necessary when this is possible to increase the establishment to an extent which will permit of tending the whole of the crop to be sown, i.e., possibly 2,500 acres per annum and of extracting the timber which will be felled in the course of the tending. From experience of similar work in Coorg where, though the old crop is much more valuable, the young crop consisting of teak, rosewood, and Pterocarpus is much more costly to raise, I think it will be found that the timber which will be extracted in the interests of the young crop will more than cover the cost of establishing the latter even leaving out of account the patches containing fine timber. Including these latter the net result should show a fair profit, and the new crop should thus be established at no cost. To extract the timber at a profit however it is imperative to improve the rivers so as to facilitate floating which at present both in the Kumharadari and Paishwani rivers is very difficult and costly. Mr. Peddie of the Public Works Department has recently prepared an estimate for improving the Paishwani and I recommend that the work should be sanctioned and put in hand during the next dry weather. I also recommend that Government be asked at once to depute an officer to examine the Kumharadari river this dry weather and to submit an estimate for its improvement.

6. When the Paishwani has been improved and it should be possible to do this before the floating season of 1921 a large quantity of timber can be extracted from the over-mature patches in this valley commencing with the Jalsur East reserved forest where fellings as prescribed in Mr. Hart's working-plan are now in progress, although, owing to the difficulty in floating, the possibility laid down by him cannot be worked up to. He prescribed merely selection fellings. I propose to fell much more heavily and in fact to carry out fellings under the uniform method on the lines of those which you saw in Coorg. Mr. Hart estimates the possibility under his method at about 11,000 tons from about 400 acres. Under the uniform method it should be a good deal more but making allowances for unduly sanguine estimates and retaining Mr. Hart's figure there is ample work to keep the establishment employed for a couple of years or more.

7. In addition to the river training works it will be necessary largely to increase the dragging facilities in the Jalsur East and the other larger areas of good timber. I propose that the American Consulting Forest Engineer should be taken to the Paishwani valley and asked for his opinion, but the country is fairly easy and in the meantime I am in favour of constructing a considerable length of drag paths in the Jalsur East reserved forest in order that large quantities of timber can be dragged down to the Kandaka stream, a tributary of the Paishwani, which skirts the reserve, in time to be floated in the monsoon of 1921. Ranger Swamikutti could, I think, easily carry out the work of aligning these paths, and there is no reason why considerable progress should not be made next monsoon. With a good system of drag paths I foresee no difficulty in dragging by means of elephants and buffaloes or possibly a tractor a much larger quantity of timber than has yet been attempted.

8. I have alluded more than once to the question of establishment. My ideas on the subject are possibly on the large side, but I feel that here we have a property of very great potential value and if the Forest department is to justify its existence it is high time we set about to put that property into the best possible condition and to make two or more trees grow where only one grew before. The existing establishment is based on the works at present in progress. These are chiefly works of exploitation and have been inaugurated from time to time in various localities in a somewhat haphazard manner; no review of the needs of the forests as a whole has ever been undertaken as far as I am aware, nor have proposals on any serious scale ever been made to develop the valuable property aforesaid. I have not yet seen the forests of North Mangalore, but I gather that with the exception of the fuel, catechu and sandalwood reserves of the Coondapoor and Udipi ranges the greater part is in much the same condition as the forests of the South Division and that the area of such forest is about 150,000 acres. We thus have 400,000 acres to deal with, or on a provisional rotation of 100 years 4,000 acres per annum to stock with a young crop and to clear of the existing one. I do not think that one Ranger can deal efficiently with the sowing, tending and fire-protection of more than 500 acres per annum, and as I very roughly estimate that the old crop will yield on the average 12 tons per acre (which means 6,000 tons off 500 acres) I think that another ranger will be required for the exploitation of this quantity of timber. Thus 16 rangers will in the not very distant future be required for the 400,000 acres of timber forest with possibly two more for fuel, catechu, and sandalwood or 18 in all, as compared with the present establishment of 7. It will also be necessary to form another division, two District Forest Officers each probably dealing with an annual regeneration area of 1,600 acres and the third with one of 800 acres in addition to the fuel, catechu and sandal work. As things are at present it is useless going into the question of the territorial arrangement of the divisions and ranges, nor do I propose to deal with the lower subordinate establishment which will be required. If my proposals are generally accepted the District Forest Officer can work out details.

9. The South Division is very badly off in the matter of buildings; if the work which I am now advocating is to be properly done it will be necessary for forest officers in future to

stay in one place for several days at a time; in the case of the local fund sheds they can never be sure of not being turned out, and these sheds are for the most part miserable affairs and usually located in the most malarious places—presumably in order to obtain water easily. Considerable expenditure therefore will be necessary in order to provide comfortable and healthy quarters for the District Forest Officer, Rangers, Foresters and Guards. Communications also are very inadequate. The good roads all run east and west across the forests and although there is a road running more or less through the forests northwards from Jalsur to near Beltangadi in three sections with a total length of about 50 miles, it is impassable for a motor-car for most of the year, and even for carts for a considerable part of the year. It is essential that we should have a road passable for a car except during heavy floods and I advocate improving this road accordingly. It will also be necessary to construct a number of subsidiary fair weather roads. This would probably cost in all about Rs. 2 lakhs while another sum of about Rs. 1 lakh will be required for buildings. In the North Division which I have not yet seen possibly Rs. 2 lakhs would be required for similar work, while propably Rs. 2 lakhs would be required in both divisions together for river improvement work. The total outlay would thus be in the neighbourhood of Rs. 7 lakhs. This does not make provision for dragpaths and carting roads for extracting timber to the rivers; the country is as a rule fairly easy and these should not cost very much; their cost will moreover be covered almost immediately by the sale-proceeds of the timber extracted. The Rs. 7 lakhs referred to represent a capital investment. My figures are of course very rough; details have to be worked out by the District Forest Officers.

10. Seven lakhs is perhaps a somewhat alarming figure compared with what the department is accustomed to spend, but the district has been starved in the past. The total expenditure in the whole district (North and South Divisions) during the last twenty years has been on roads and bridges Rs. 27,763; on buildings Rs. 58,435; on sowing and planting Rs 5,154; and on other works of improvement (A. VIII. g) Rs. 17,631; and annual average on works of improving the forest (exclusive of protection from fire) of Rs. 5,419. With expenditure on these lines we are not going to make much progress.

11. On the modest estimate of 12 tons to the acre referred to in paragraph 8 the annual yield obtained by working 4,000 acres per annum would be 48,000 tons. A very low estimate of the net profit obtainable on this is Rs. 10 per ton which means an annual profit of nearly Rs. 5 lakhs; this after paying for the necessary sylvicultural work and establishment (perhaps Rs. 2 lakhs) would in the course of a very few years repay all the capital invested. It must also be remembered that the existing crop is growing larger every year and that the annual yield will thus gradually increase.

12. In the immediate future I propose as outlined in paragraphs 4 to 7 to sow 1,000 acres per annum in the South Division, to render floating in the Kumaradari and Paishwani rivers easy, and to extract as much timber as possible from the Jalsur East reserve. For this at least one additional ranger is required, and the District Forest Officer is now preparing proposals to split the existing unwieldy Uppinangadi range which covers 154,000 acres. I am also giving orders to have 1,000 acres sown this year in the North Division. I also propose to close down the various scattered works such as improvement fellings, climber cuttings and the like which are now proceeding in what I have called a somewhat haphazard manner, and to concentrate all the energies of the division of the new work. Fire protection of the sown area will be a sine qua non and I am calling on the District Forest Officer to submit proposals. As regards the North Division I hope to tour there next year and to work out some definite details as to what is required.

13. If you agree with my views I request that you will put my letter before Government. I think that it should know what a potentiality fine property it possesses in its South Kanara forests and be requested to state whether it is prepared to make the outlay necessary to put that property into order. In any case the outlay is not likely to be more than about Rs. 2 per acre, and this will probably very soon be recouped. My scheme is not—as I had hoped—one which is going to bring in a large return at an early date, but the owner of a forest property must look a long way ahead; in this case the return though long deferred should be a very fine one.

II

Official Memorandum No. 1589/21-I.B.-1, Public Works, dated 7th September 1921.

A copy of the letter from the Chief Conservator of Forests, Reference No. 298-20-2, dated 20th August 1921, together with its enclosure is herewith forwarded to the Superintending Engineer, IV Circle, who is requested to arrange for an early examination of the four rivers referred to therein with a view to improving their floating capabilities and submit a report on the subject.

(By order)

R. NARASIMHA AYYANGAR,
Under Secretary to Government.

To the Superintending Engineer, IV Circle.

III

Letter from P. Hawkins, Esq., M. Inst. c.e., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated Coimbatore, the 11th August 1922, No. 239-I.

With reference to your Memorandum No. 1589/21–I.B.-1, dated 7th September 1921, I have the honour to forward herewith the marginally noted five estimates aggregating to Rs. 5,88,500 together with a preliminary report submitted by the Subdivisional Officer and a tracing. On the basis of the standard of clearance adopted the Kumaradhari and Gundia rivers can be cleared fairly easily while the others would be expensive.

	Rs.
(1) Blasting rock and clearing obstructions in the Kallaja hole	5,000
(2) Blasting rock and clearing obstructions in the Kumaradhari hole	1,90,000
(3) Blasting rock and clearing obstructions in the Gundia hole	33,000
(4) Blasting rock and clearing obstructions in the Netravati river	3,55,000
(5) Blasting rock and clearing obstructions in the Shisla hole	5,500

The amount of clearance which the Forest department would require is, however, not quite certain. Much would depend upon the season of the year at which their rafting operations would be undertaken. I have instructed the Executive Engineer to consult the Forest department on this point with a view to fix the level down to which a channel should be cleared, and am also consulting the Conservator of Forests, Sixth Circle.

I am sending you separately a report of progress on the Paishwani river which has been satisfactory.

Enclosures

(1)

Letter from the Assistant Engineer, South Kanara subdivision, dated the 10th July 1922, No. 738-E.1

Report on floating capabilities of certain rivers in Uppinangadi taluk.

I submit herewith the report received from Overseer M.R.Ry. S. Nanjunda Ayyar on the investigation of the four rivers specified in the letter from the Conservator of Forests, Sixth Circle. I regret I had no opportunity to examine the rivers which I wished to do after the receipt of his report, but having to attend to the Paishwani river work he could not submit it earlier. It is now too late to examine the rivers owing to freshes.

2. To enable the floating of timber the rivers have to be improved at a prohibitive cost—approximate estimates are attached :—

(1) (*a*) Kallaja hole for a length of 9 miles above its junction with the Kumaradhari—Rs. 5,000.

This was included in the investigation as decided by the Chief Conservator of Forests during the conference held in December last.

(*b*) The Kumaradhari from the infall of Kallaja hole down to Uppinangadi—about 32 miles—Rs. 1,90,000.

(2) The Gundia from Gundia down to its junction with the Kumaradhari—length about 16 miles—Rs. 33,000.

(3) The Netravati and its affluent Charmadi hole from Charmadi down to Panemangalore—Rs. 3,55,000.

The portion between Uppinangadi and Panemangalore which will cost about Rs. 20,000 was included as decided at the conference. This will be necessary in case the Kumaradhari alone is to be improved.

(4) The Shisla from Shisla to Parasurama devasthanam—a distance of about 8 miles Rs. 5,500.

Below Parasurama devasthanam it will not be possible to float timber since at Parapikallu obstruction the river has a sudden fall of 20 feet, and below the river runs in deep and rocky gorges with zig-zag course and sudden drops with right angle bend at every fall for a length of about 3½ miles. Even if it be possible to improve the river the cost will be too prohibitive. Therefore the portion below Parasurama devasthanam has been omitted. Timber may be floated down from Shisla to the above point whence it may be carted to 37 miles on Shiradi road. From there it can be sent down the Netravati.

(5) The obstructions in items 1 (*a*), 2 and 4 are in no way formidable.

Item 1 (*b*)—*Kumaradhari.*—At Yakkadka, below the junction of Gundia and at Viramangila there are drops in the river of 5′ to 6′; the river course is very zig-zag, the bed very rocky. Also commencing from Narimogaru down to the junction with the Netravati the river has rocky bed with projecting boulders with winding and zig-zag course, deep and rapid gorges and drops.

Item 3—*Netravati.*—At Arbi obstruction about a mile below the Dharmasthala road crossing the river has a sudden fall of 15′ to 20′ and runs in deep rocky gorges with zig-zag course for a length of about 2 miles. There are similar difficult obstructions (1) about half a mile above Dharmasthala road crossing, (2) below the junction of Beltangadi hole (3) beyond Uppinangadi to the west, viz., Shripadi obstruction, (4) at Bantwal. But the worst of these is the one at Arbi.

(6) Considering the prohibitive cost of improvement of these rivers, Netravati in particular, the improvement of this river from Charmadi down to 37 miles on Shiradi road may be altogether dropped.

The cost of improvement to the Netravati below 37 miles on Shiradi road will be about Rs. 28,000.

(7) The estimates allow for clearing a channel 20′ wide to enable timber being floated. The rate allowed is the same as that for Paishwani river work.

(8) The six atlas sheets received with No. 949-S.K., dated 21st December 1921, are herewith returned.

(2)

General report to accompany the estimates for blasting rock and clearing obstructions in the rivers in Uppinangadi taluk.

[Amount of all estimates Rs. 5,88,500.]

These have been prepared as per reference from the Chief Conservator of Forests in his No. 298/20–2, dated 20th August 1921, requesting to inspect all the rivers in Uppinangadi taluk regarding their floating capabilities bearing Public Works Department Memorandum No. 1589/21–I.B.–1, dated 7th September 1921.

All the rivers as per the reference of the Conservator of Forests have been investigated by me with the help of Forest Guards guiding me along the margin, and estimates have been prepared for all the rivers except one, i.e., Shisla hole for which an estimate has been prepared till Parasurama Devasthanam and beyond Parasurama Devasthanam it is not possible to float since at Parapikallu where the river falls vertically by 20 feet and from there the river goes in deep gorges with steep rocky margin and with right-angular turnings at every fall. Below this Parapi for a length of 3½ miles the river goes in rocky gorges with many bed falls and zig-zag turnings. So the portion from Parasurama Devasthanam up to the junction with Netravati has been left out and the timber can easily be carted on road from Parasurama Devasthanam up to 37th mile on Siradi road and then floated in the Netravati.

Kallaje hole.—There are not much obstructions in the river except at few places and that too not difficult ones.

Kumaradhari.—The difficult portions are at (1) Yekkada, (2) below the junction with Gundia, (3) Viramangila, (4) Narimogara commencement up to junction with Netravati.

Gundia hole.—There are only very few difficult obstructions in this river.

Netravati river.—The difficult portions are (1) half a mile above Dharmastala road crossing, (2) one mile below Dharmastala road crossing known as Arbi obstruction, (3) below the junction with Beltangadi hole, (4) Shripadi obstruction, (5) Bantwal obstruction.

Of all the above obstructions, Arbi obstruction is one of the difficult ones where the water falls vertically from 15 feet height and below for a length of two miles the river goes in rocky beds with zig-zag turnings and also with bed falls here and there.

Shisla hole.—There are not much rock from Shisla down to Parasurama devasthanam but there are lot of temporary dams built across the river for irrigation purposes.

The estimate provides for blasting rock and removing the same and also for erecting sheds for work people and storing materials tools and plants, etc. The rate allowed for in the estimate is as for Paishwani works in progress.

(3)

Endorsement by the Executive Engineer, West Coast division, No. 828-S.E., dated 20th July 1922.

Forwarded to Superintending Engineer, IV Circle, with maps showing the different names of the rivers dealt with. I have not been able to make any inspection of the rivers personally and inspection before the end of the monsoon would be useless. But from the Subdivisional Officer's report which is very clear, it seems that the Kumaradari river and the Gundia can be improved at a reasonable cost. While with regard to the others the cost seems prohibitive. Inspection will be possible probably about November or December next and I will then submit a further report if you think it necessary.

Order—No. 1456, Development, dated 4th November 1922.

In August 1921 the Chief Conservator of Forests submitted proposals that certain rivers in the Uppinangadi taluk in the South Kanara district should be investigated with a view to clearing the obstructions in their course in order to facilitate the floating of timber from the forests of that taluk. The preliminary investigation has been made by the Public Works Department and the total cost has been estimated to be Rs. 5,88,500. The Government consider that the operations on these river beds must await the investigation by the Chief Forest Engineer of the whole scheme for the development of the South Kanara forests.

2. The Chief Conservator of Forests is requested to submit a report as to the effect of similar operations undertaken in the Paishwani river with reference to G.O. No. 369 I., dated 20th November 1920.

(By order of the Governor in Council)

H. G. STOKES,
Acting Secretary to Government.